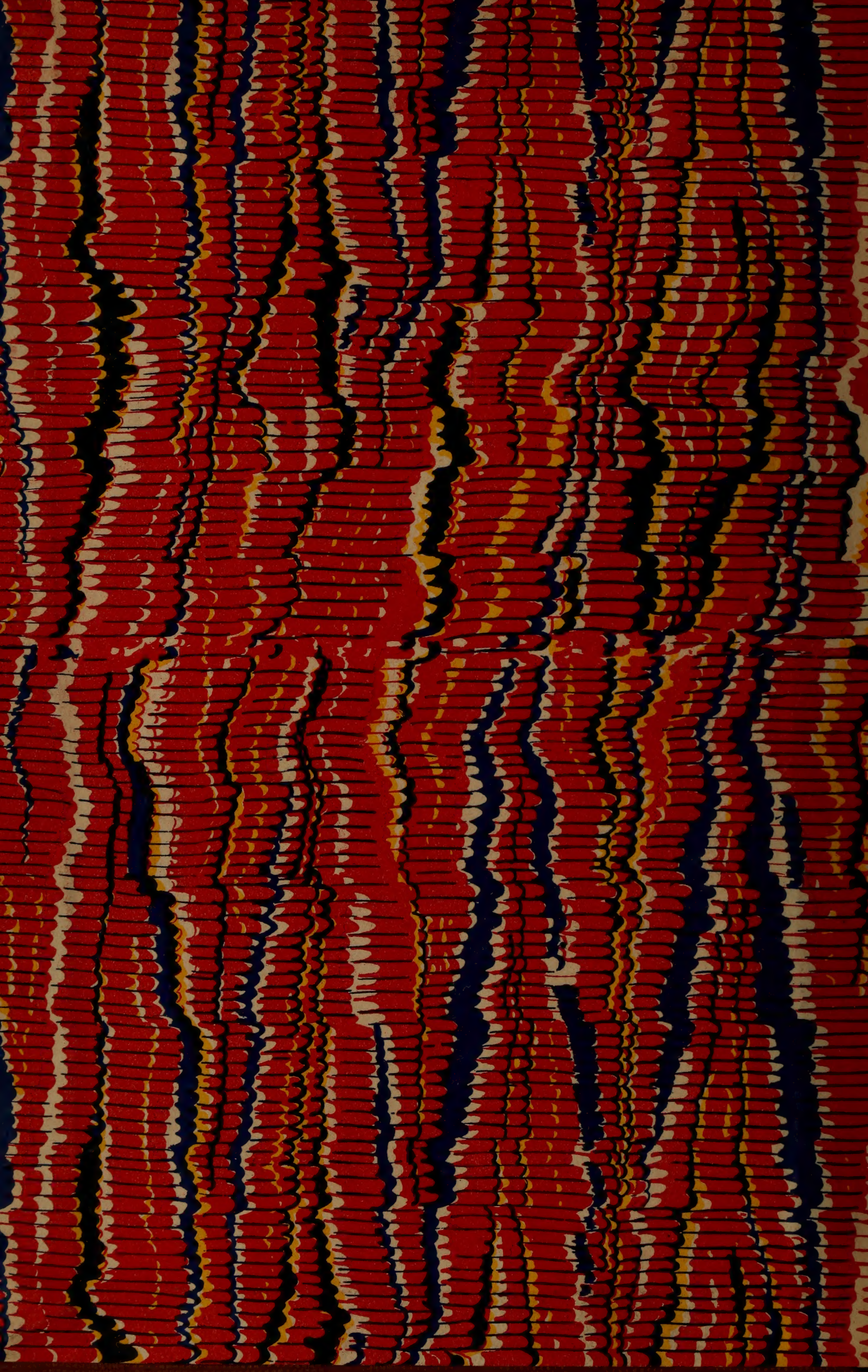


Pat
186
3
71972
164

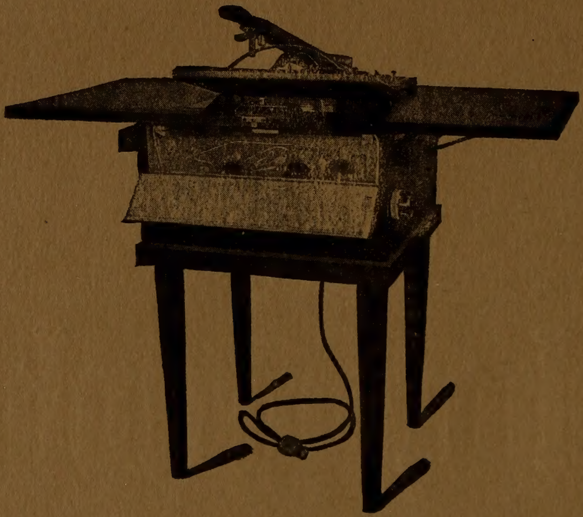
57. No. 1 January 1920 20 Cents

The Photographic Journal

of America

Smithsonian Institution
289565
JAN 9 1920
National Museum

Published Monthly
With Illustrations



Efficiency in the Printing Room

can never be obtained with make-shift or antiquated equipment. A reliable, scientifically correct, modern printing machine is essential in the production of work of highest quality.

The Ansco 11 x 14 Professional Printing Machine is designed for general use. It is easy to install, economical to maintain and uniformly dependable as to light.

PRICES and full description of this Printer and other Ansco professional apparatus for photographic studios will be mailed on request.

ANSCO COMPANY
BINGHAMTON, N. Y.

New York	San Francisco	Chicago	Toronto
129-131 West 22nd St.	171-173 Second St.	308 N. Michigan Blvd.	347 Adelaide St., W.

THE PHOTOGRAPHIC JOURNAL *of* AMERICA

REGISTERED IN THE UNITED STATES PATENT OFFICE

NEW SERIES: WILSON'S PHOTOGRAPHIC MAGAZINE

AN ILLUSTRATED MONTHLY DEVOTED TO THE SCIENCE AND ART OF PHOTOGRAPHY

THE OLDEST PHOTOGRAPHIC MAGAZINE IN AMERICA
Founded 1864

Incorporating:
The Philadelphia Photographer The Photographic World

THOMAS COKE WATKINS, Editor

CONTENTS FOR JANUARY, 1920

A Talk on Posing . . . . . C. S. T. 3
Making Cold-process Stripping Paper and Plates for Developing or Printing-out by Hand or Machine. Part IV. . . . . . Alfred J. Jarman 7
The Artistic Use of the Medium 11
Editor's Table—1919 and the Future—The Present Need 19
The Studio—Practical Papers on Studio Work and Methods 21
Abstracts and Translations . . . . . E. J. Wall 26
Views and Reviews 28
The Workroom 31

Index and Table of Contents for 1919 Furnished on Application

YEARLY SUBSCRIPTION, in advance, postage paid, United States, Mexico, Cuba, Philippines and Porto Rico, $2.00; Canada, $2.35. Countries in the Postal Union, $2.75. Single copies, 20 cents.

REMITTANCES may be made at our risk by money order, check, draft, or registered letter.

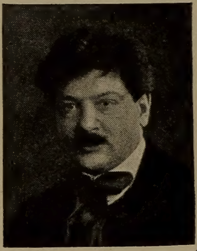
SUBSCRIPTIONS begin with current issue.

Published by EDWARD L. WILSON COMPANY, INC.,
THOS. C. WATKINS, President. 701 Arch Street, Philadelphia, Pa.
EXECUTIVE and EDITORIAL OFFICES, CAMERA BUILDING, 122 EAST 25th ST., NEW YORK CITY
HOUGHTON'S, Ltd., London, Eng., Agents for Great Britain
American News Co., Distributors for U S. Kodak Australasia Ltd., Sydney, Agents for Australia
RICHARD HILL, Devonport, Auckland, Agent for New Zealand

Entered at Philadelphia Post-office as Second-class Matter

This is one of a series of sketches on Leading American Photographers

American Photographers



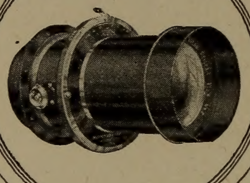
JOHN H. GARO.—In historic old Boston dwells and works a photographer renowned throughout the photographic world. John H. Garo is the man, better known as "Jack" Garo—painter, portraist, artist, photographer.

There is a distinctive something about his photographs that ever reflects the artistic personality of Garo himself—perhaps an unusual lighting effect, or a picturesque interpretation of the subject, a conception always out of the ordinary, carefully studied in every detail, yet peculiarly unstudied in naturalness of pose and general effect.

Mr. Garo has held office as president of the New England Photographic Association, and the countless trophies, cups and honors awarded him, bear witness to his eminence in national and international photographic circles.

It has been our pleasure to supply Mr. Garo with all of his studio lenses, the Vitax that he uses for the majority of his work and the Verito for soft focus results; and he has expressed entire satisfaction with his equipment.

Let us send a catalogue and tell you why Jack Garo employs Wollensak lenses,—exclusively.



This is Mr. Garo's lens choice—VITAX PORTRAIT F:3.8. It is an improvement on the Petzval type, equipped with diffusing device, 10", 13½" and 16" foci, and supreme for large heads, busts and child photography.

WOLLENSAK OPTICAL CO.

ROCHESTER, NEW YORK.

AMERICAN MADE **REXOLON** DEVELOPING AGENT

Rexolon is a new universal developing agent. Rexolon offers unusual, distinctive and important advantages over all other developing agents.

1. Rexolon is chemically pure and lasting.
2. Rexolon is distinctive for the non-oxidizing qualities. It will stand in an open solution twice as long as German metol
3. Rexolon is non-poisonous to the skin, a characteristic which will appeal to all subject to metol poisoning.
4. Rexolon is a soft developer, greater contrast can be obtained by the addition of bromide, which within certain limits does not affect the tone.
5. Rexolon will produce good blacks and whites even if the negatives are under or over exposed.

Rexolon is being rapidly stocked by all photo dealers. It will pay you to give it a trial.

Put up in one, four and eight ounce bottles, also in one pound bottles.

One ounce bottle........................$1.35

CHICAGO = Burke & James Inc = NEW YORK

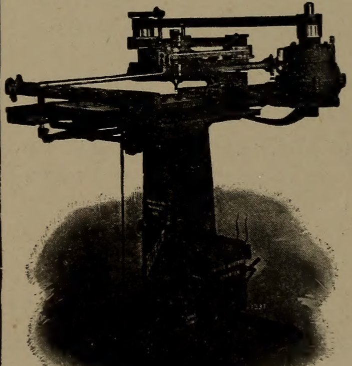


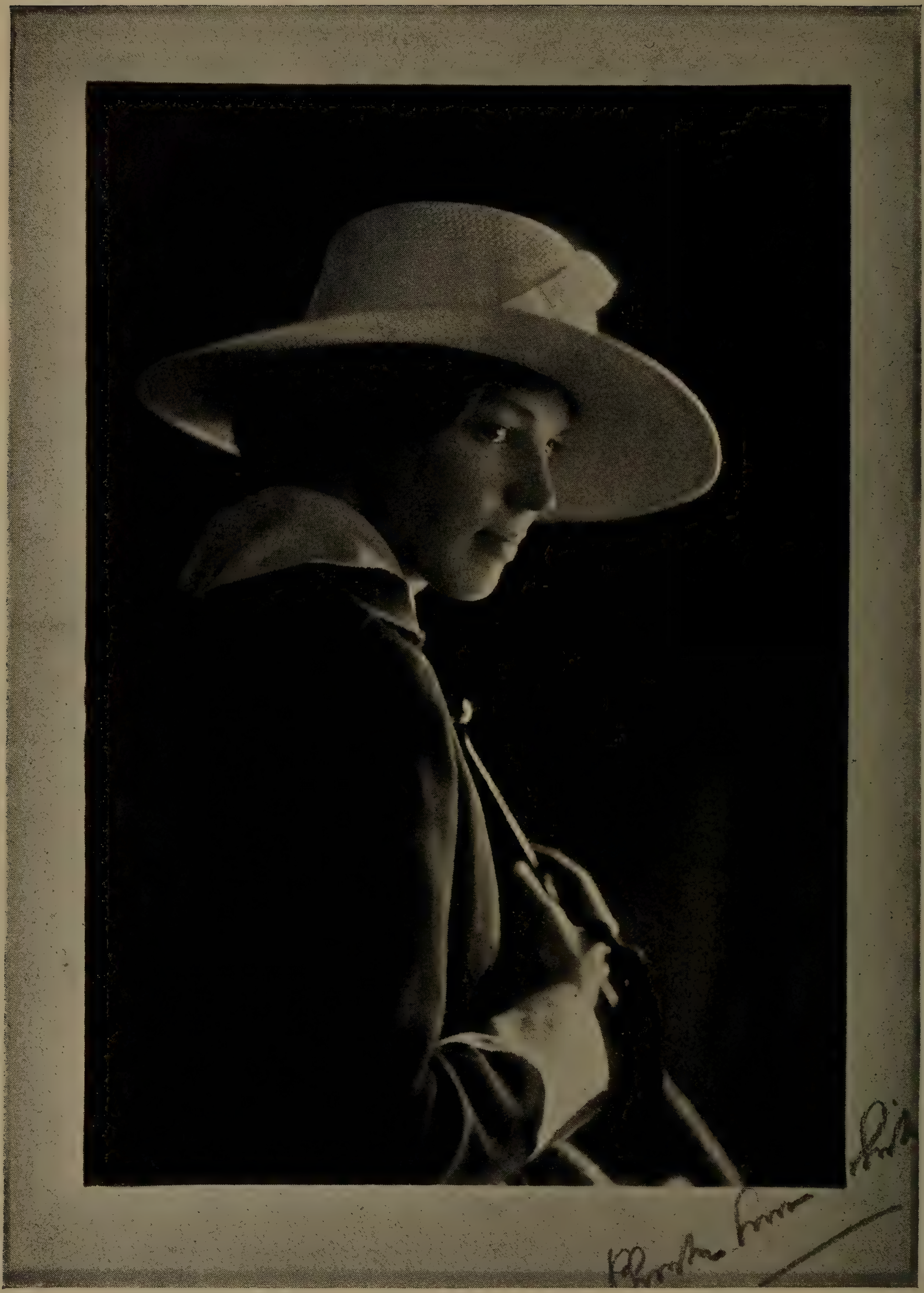
PLATE FINISHING

machines for the photo-engraver. Carefully and expertly constructed to give pleasing continuous service and the most practical advantages. Every operation provided for.

WRITE FOR PRINTED MATTER

JOHN ROYLE & SONS, PATERSON, N. J. U. S. A.

Routers, Lining-Bevelers, Saws, Trimmers, Router Cutters, Etc.



By PHOEBE ANN WHITE
OKLAHOMA CITY, OKLA.

The PHOTOGRAPHIC JOURNAL of AMERICA

VOLUME LVII JANUARY, 1920 NUMBER 1

THE AUTHORITY FOR THE PROFESSIONAL PHOTOGRAPHER
PJA
FOUNDED 1864

Smithsonian Institution
JAN 9 1920
National Museum

A TALK ON POSING

By C. S. T.

THERE are many photographers of skill who stoutly affirm that the art of posing cannot very well be taught; that this very desirable facility is not to be acquired either with the aid of personal instruction or through the medium of printed text. That this viewpoint is altogether wrong, a little knowledge of the subject will quickly prove and as quickly banish the glamor of mystery which many amateurs associate with the skilful posing of the human figure. Despite the opinions of many able camera workers, who declare that posing is a matter of inborn good taste, or a gift, I shall endeavor to point out, that the pose is really nothing more than a method of expression, quite the same as writing or speaking, and that, by observing certain fundamental forms, it is quite as possible to cultivate a knowledge of how to pose as it is to become proficient with the pen or to acquire a pleasant and expressive manner of speaking. At the beginning it may be well to remark that the object of a portrait is, first, to portray the likeness of the model, then to bring into being the characteristics of that individual, and, lastly, so to arrange the figure within the picture plane that the effect may be pleasing to the eye. This arrangement of the figure to fit a space is the mission of the pose, while the arrangement of the lines and masses of a figure, together with the distribution of light and shade, is known as composition. Thus you see a portrait should possess three elements: likeness to the original model, an agreeable arrangement of the figure within the picture space, and a harmonious distribution of light and shadow, which will bring out or emphasize the character, beauty, or grace of the model.

In nature as in art, we find that the different forms of objects have a deep significance to us and that different forms bring different sensations to our minds. Nearly everyone can appreciate the greater beauty of an oval when compared to a square, and see that a curved line is far more beautiful than a straight one. And this is so because the curved line appeals more strongly to our imagination and by reason of its greater variety; the circular line creates in our mind a greater number of suggestions or ideas. As a curved line gives us the greater pleasure, so does a vertical line give us the idea of support or stability; a horizontal line the idea of repose; while lines drawn at an angle from the perpendicular suggest life and action. This brings us to the expression of beauty in lines, and in his *Analysis of Beauty*, a rare work, published in the year 1752, the artist Hogarth speaks thus of a flowing line: "The serpentine line, by its waving and winding in different ways at the same time, leads the eye in a pleasing manner along the continuity of its variety, which line with the triangle gives the most expressive of figures, signifying not only beauty and grace, but the whole order of form." This line is often called by painters the "line of beauty." Raphael was an exponent of this serpentine line, and in the reproduction of his Parnassus the grace and elegance of this line of beauty can be observed.

Much of the failure that comes to discourage the photographer who takes up portraiture in a serious way is due to the ability which the camera has of clearly delineating both the undesirable as well as the desirable feature of a view. This is one of the greatest obstacles the portrait photographer has to overcome, and too much care cannot be taken to preserve the simplicity of a portrait; that the eye may not be attracted by an overabundance of unimportant detail, but that the interest may at once be drawn to the personality of the model itself. While in the majority of portraits the center of expression is usually in the head or face, the other members of the body play a very important part also. The attitude of the body should be given due attention and not ignored as a means to express character and individuality. In every picture there can be but one object upon which our interest is centered, and to this objective point all lines should lead, that the eye may not stray along a confused tangle of conflicting lines, but be rather led without an effort to the point of greatest interest. It is not at all necessary, as many seem so inclined to believe, to throw all but the principal object of interest out of focus; but it is important to so subordinate the lesser details or accessories of the portrait that they may not draw attention away from and so conflict with the principal point of interest. A reasonable amount of detail is a necessary part of a portrait, for without some support the composition would be lacking in variety, and thus simplicity if carried to excess will produce monotony and dulness, and so defeat our ends. Variety may be well considered as being one of the principal sources of beauty, and unless carried too far it is a very important factor in photography, because by the introduction of several forms, lines, or shadows we give relief to the eye and so furnish entertainment for the mind.

Repetition is likewise an important aid, and by thus introudcing repetition to oppose variety, we echo, as it were, the major chord. Yet in our desire for variety we must ever bear in mind, that a pleasant and well-balanced composition cannot be had unless there is harmony between the several parts of a photograph, or, in other words, we must have variety with unity. Alison, in his essay on "Taste," speaks thus pertinently of harmony: "Beautiful forms must necessarily be composed both of uniformity and variety, and this union will be perfect when the proportion of variety does not encroach upon the beauty of unity."

This may be also said of uniformity and symmetry, which if carried to extremes result in monotony and weariness. In our oval we find a good example of variety in unity, while the outline of a square expresses the opposite sensation, unity without variety.

Stability of support is yet another important element of the pose, expressing the idea of strength and rest. One of the most graceful as well as the most simple expression of support is found in the forms of a triangle, where each line is found to support or balance that of another. This pyramidal form of design we find in many famous paintings, and in portraiture the pyramid or triangle form in its many variations and modification is of the greatest assistance to the photographer. If we have lines running in but one direction the effect is noticeably weak and one sided, and to remedy this awkwardness other lines running in an opposite direction are introduced for the sake of balancing.

As the photographer's chief aim is to decorate a space, the worker should keep in mind those essential underlying principles which have just been mentioned. In the composition of the figure two methods are at the photographer's command: One method is known as the "decorative line," a form of arrangement which is very popular with many modern painters. This method, wherein the line of decoration is both the beginning and the end of the composition, is seen in all its beauty in the work of the Japanese painters, and as a medium for the expression of the worker's individuality the decorative design has, perhaps, more scope for freedom of execution through the more conventional forms of composition.

The other method of arrangement is the better-known conventional composition, and numberless examples may be seen in the many works of master painters of both the old and the modern schools of painting. In this method the figures are designed to conform with certain fixed principles; and while many artists and art critics believe this order of design lacks the freedom of the decorative composition, this conventional design has long been regarded as the foundation of art. This order of form in figure composition is based upon the circular and the triangle line and their numerous variations, and from the significance which these lines bear in the arrangement of objects various art writers have divided these designs into circular and pyramidal compositions.

Circular composition is of value where several figures are grouped within the picture space, and by its simplicity and pleasant sweep a great deal of character is given to the composition. The circle with its variations, such as a circle within a rectangle, oval, ellipse, and so on, are not so widely used in photographic compositions as other forms. In outdoor portraiture the circular line is of great assistance in combining the landscape with that of the figure, thereby producing a union and balance of masses and shadows upon which the pictorial effect of the group so largely depends.

The triangle or pyramid is especially adapted to the pose of a single figure, and for this reason has been much used by the photographer. The pyramid is capable of many variations, and may be lengthened or shortened at its base or sides, inverted, and changed in many ways.

The vertical figure in composition can be oftentimes made to express a great deal, but in amateur photography the successful handling of the vertical is not so often seen as other positions of the figure. The vertical line is unquestionably a very attractive line in the portrayal of art, and the greatest drawback to its successful representation is found in the spaces unoccupied by the figure. By a vertical is usually meant a standing one, where the model occupies considerably more picture space than if the same figure was sitting or reclining. The greatest objection to this vertical line is that the two oblong spaces upon either side of the subject show an emptiness, or blackness not at all in unity with the figure. In the full-length portraits of women this point is not so strongly marked, as the angular line of the skirt breaks into the regularity of this side space. But in the portraiture of men the full-length figure presents a much more difficult problem, as masculine apparel is not so well adapted for this purpose. To preserve the unity of the vertical figure the empty side-spaces must be broken of their regularity, and if this is accomplished by letting the figure encroach upon these side-spaces the unity of the composition is complete.

But whatever form of composition is selected to express our idea of a pictorial photograph, the worker should by no means attempt to closely follow any contour of design, but, by keeping fresh in memory those principles already given, should aim so to treat each figure in his composition that beauty, grace, and character may be represented in the pose. The means employed should not be made too evident, nor should too much care be devoted to its concealment, which, unless very ably done, shows the trouble we have taken to "conceal the art for art's sake."

While a multiplicity of directions might be given for posing the body, the head, the hands, and so on, yet it is evident that any set of rules can be of but little, if any, real benefit; for unless the worker understands the underlying principles of the subject, he can only follow blindly such methods of procedure, imitating the effect without knowing the cause. With this point of view in mind, I shall merely mention the important considerations of the subject, and simply suggest to the reader the points which should be kept in mind when an attempt is made to pose the model.

Formality should never enter into the pose—for, if a formal pose is selected, the greatest bugbear of the photographer, stiffness, usually creeps in to rob the work of its greatest charm. It may be said that women are easier to pose than men, and this is true, not only because the feminine costume is better suited for artistic endeavor, but is also accounted for by the grace of the subject herself. It is a woman's inheritance to look dainty and beautiful; while in a man we naturally seek for character, strength, and ruggedness. A nervous consciousness should be avoided at all times, and for this reason it is a most excellent idea to interest the model in some of the many little things so natural to the subject and which every-day association so constantly recall to mind. The simple act of buttoning a glove, holding a fan or arranging of flowers, will add a motif and interest to a portrait often unobtainable in any other way. The sudden suspension of motion, which is so admirably seen in statues, is yet another means of obtaining animation in the model. Perhaps it is nothing more than arranging a lock of straying hair. Reading, sewing, and writing also lend aid in relaxing the body, that it may assume a graceful, easy and natural pose.

The arrangement of the hands in a portrait is often one of considerable difficulty and various methods are made use of to lessen conspicuousness of the hands. The principal reason for failure is due to the feminine subject, who invariably complains that the hands appear unnaturally large. This dissatisfaction arises, not because the hands are usually out of proportion with the head or other parts of the body, but is principally due to the artist who, previously to the introduction of photography, erred in drawing the hands and feet much smaller than the natural size. This error is a traditional one, and while the camera has corrected much of the former exaggeration of the pencil and the brush, the hands are still the cause of much dissatisfaction. Unlike the painter, the photographer must, for the sake of focus, keep the hands in the same plane as the head, and upon this account the camera worker is greatly cramped in working out his pictorial ideas. If one gives an occupation for the hands, their natural disposal is assured, providing they are occupied in a manner which harmonizes with the subject or motif of the photograph. The two hands should never be occupied separately, doing two things, because attention is drawn and confusion is created. When the hands are brought together, care should be taken to avoid having their position form any noticeable figure or angle which will conflict with the pose of the head or body. In some positions the hands appear much larger than in others, and this is especially so when the broad back of the hand is seen, or when the hands are brought close together with the fingers interlocked, which under a broad lighting appear like one hand. A long wrist is often exaggerated in this manner. The light should never fall too strongly upon the hands, and seldom with the same intensity that illuminates the face or figure.

Expression in portraiture does not consist in forcing the features to assume an unnatural, intense expression. Many faces are very beautiful in repose, a few appear almost idiotic when a smile is attempted, and very few indeed can be portrayed when laughing heartily.

A smile, if natural, is beautiful; but a made-to-order simper is far from attractive. Animation is, upon the other hand, suitable for all subjects and fully deserves the closest attention of the camera-worker. The attitude of the figure should be in perfect harmony with the face and the expression should be characteristic of the individual, while the scheme of light and shade should bind all together. If this is intelligently done the photograph should portray the desirable and agreeable characteristics of the sitter, which is indeed all that portrait photography can be expected to accomplish.

MAKING COLD-PROCESS STRIPPING PAPER AND PLATES FOR DEVELOPING OR PRINTING-OUT BY HAND OR MACHINE

By ALFRED J. JARMAN

Part IV

A PHOTOGRAPHIC image upon a stripping plate lends itself admirably for production in a very novel way of a colored image upon canvas or linen. In the first place the photographic film renders a perfect likeness of an object or person with all the needed detail and half-tone, while the color added, by means of thinly mixed oil colors, upon this image produces a picture closely resembling a genuine oil painting.

Making Stripping Plates for Development

The glass plates employed for this process must be thoroughly cleaned previous to coating with emulsion. Good glass for this purpose may always be obtained by the employment of disused negatives, which should be treated with hot soda water, to rid them of the gelatin film, cleaned by rubbing with a rag mop, then rinsed under the faucet, placed in a bath of acidulated water, composed of hydrochloric acid, 1 ounce; water, 30 ounces; then rubbed well in this solution, rinsed again under the faucet and placed in a clean rack to dry.

As soon as they are dry they must be rubbed all over with a small pad of canton flannel moistened with a waxing solution composed as follows:

Waxing Solution for Stripping Plates

Spirits of turpentine . .	5 fl. oz.
Benzine	5 fl. oz.
Beeswax	30 gr.
Yellow rosin	90 gr.

The beeswax should be melted with the rosin in a small enamelled saucepan, over a gas-stove or other source of heat, then withdrawn, and the turpentine and benzine added while at a safe distance from flame or heat, the whole being stirred with a teaspoon, then transferred to a suitable bottle and corked ready for use. A small quantity of this mixture only is used upon the pad.

As soon as a number of plates have been waxed, take the first one treated and polish the surface all over well with another clean pad, of either soft rag or canton flannel, until a clinging action is felt; then a slight polishing after this will complete the operation of waxing the plate. Treat the number required in the same way, then coat each plate carefully with plain collodion, and rack the plates to dry. When dry they will be ready to coat with the emulsion in the same way as the plain plates were coated, as previously described.

These stripping plates may be exposed and developed in the same way as already described for transparency plates, only the development must not be carried as far as for a transparency that is to be viewed by transmitted light, because as a painted portrait it is to be viewed by *reflected* light.

When this transparency has been made, well washed and dried, it may be colored with *thinned* oil colors, so as to produce an even coloring, and the coloring allowed to become well set and dry; not only surface-dry, it must be allowed to remain for four days or a week, so that the coloring becomes hardened all through, not merely superficial. Then, to produce a portrait that has all the appearance of a canvas painting, a piece of white muslin must be prepared by brushing the surface well over with a clean, clear sizing, in a warm or hot condition, made of:

Clear soft gelatin	1 oz. av.
Water	4½ fl. oz.
Wood alcohol	½ fl. oz.

This mixture, when melted and in a hot state, must be strained through a fold of cheesecloth that has been wetted and well wrung-out into a suitable earthen vessel, such as a jam-pot. The linen or canvas so treated must be laid down upon the painted transparency by holding it so as to take the form of the letter U, lowering each end. Then place upon the back of the linen a piece of thin rubber sheeting, and apply a soft squeegee from the center outward, first to the right, then to the left, so as to ensure the elimination of air-bubbles, which may be easily detected by turning the plate over and viewing from the front.

The linen or canvas, now firmly attached to the plate, must be allowed to become *thoroughly dry*, which may require from two to four days. Then, when dry, cut a clean edge about an eighth of an inch from the outside all around the plate, lift one corner by the aid of the tip of a penknife, when the whole may be easily lifted from the plate, and it will be found that it presents a beautiful colored portrait with the weave of the linen or canvas impressed throughout with a glazed surface.

The full impress of the weave of the linen or canvas may be obtained if the removal takes place a short time before the whole is completely dry. It will be found when the stripped picture is then allowed to become dry that the impress of the weave is so decidedly marked that, to all appearances, the painted portrait appears to be upon the canvas, which may then be mounted or framed to taste.

A word of caution may be mentioned here. If the canvas or linen is placed upon the oil-colored portrait before the paint has become thoroughly well set, it will be found that the canvas will strip with half of the painting upon it, and the other half will remain upon the glass, so that the painting becomes split. This, however, will not take place if the paint is thoroughly dry when the gelatinized linen or canvas is applied.

Where considerable contrast is desired in a transparency, as is sometimes the case when a negative is weak, the following formula may be used to make up the sensitive emulsion, which at the same time is extremely rapid:

Formula for Rapid Contrast Emulsion

American Company's hard gelatin .	360 gr.
Distilled water	3 fl. oz.
Potassium bromide	40 gr.
Ammonium chloride (c. p.) . . .	32 gr.
Citric acid (crystal)	60 gr.

Melt the above in a small stoneware crock, as previously described for emulsion-making. Then, under a deep-orange or ruby-colored light, with constant stirring with a glass rod or glass strip, add a small quantity at a time of the following solution:

Distilled water	2½ fl. oz.
Nitrate of silver . . .	120 gr.

As soon as this has been added, rinse the graduate with half an ounce of pure alcohol. Add this to the emulsion also. Cover the crock with its stoneware lid and heat the emulsion for twenty minutes at 150° F. At the end of this time, under the above safe light, stir the emulsion well; cover it again and cool the whole rapidly. As soon as the emulsion is well set, squeeze it through the canvas, as previously described, into cold water; five changes will be required.

Then drain well for one hour. At the end of this time melt the emulsion, add 1 ounce of pure alcohol, filter as previously described, and coat the plates. The same emulsion may also be used for paper-coating.

The developer for this emulsion may be the same as that described for the stripping paper or transparencies, or the following developer may be used:

Warm filtered water	20 fl. oz.
Metol	18 gr.
Hydroquinone	60 gr.
Sulphite of soda (dry)	150 gr.
Carbonate of soda (dry)	200 gr.

When the salts are all dissolved, by shaking the preparation well when each ingredient is added, fifteen to twenty drops of a 10 per cent. solution of potassium bromide must be added and the mixture shaken well again. As soon as it has become cold it will be ready for use. Intense blacks may be obtained by this developer.

With any of the emulsions given with these articles, excellent transparencies may be made for the lantern or for stereoscopic slides, as the emulsion is practically grainless.

It will be found that by the use of No. 1 and No. 2 emulsions the transparencies made upon glass plates, without transfer, will not only show no grain that may be present in a negative copied from a paper print, but will present the appearance of having been obtained from a negative that has been retouched. The slowness of the plate and the grainless emulsion produce this quality in the finished picture.

Coloring Transparencies, either View or Portrait, for Window Display

The coloring of window transparencies has always proved to be a very delicate piece of work. With transparencies made upon the plate as described the coloring becomes a very simple matter. All sorts of menstruums have been used to get the color to bite upon the hardened gelatin surface. The following method, however, answers admirably for dyes or transparent water-colors. Make the following solution:

Strong water ammonia	1 dram
Filtered water	20 fl. oz.

This quantity of ammonia is quite sufficient.

Having the colors at hand, thin carefully so that their tinting color may be observed upon a white porcelain palette or opal glass. Now take the transparency, say a portrait upon a 4 x 5 plate; carefully and quickly wipe the surface all over with a small silk sponge dipped into the ammonia solution. Now apply the color, say a weak crimson dye, to the face with a soft camel-hair or other suitable brush. Then, with another small silk sponge, wipe the surface all over with this sponge wetted with water only. Upon looking through the transparency the effect is astonishing. The faint crimson tint gives a fine flesh-color, and the various grades of half-tone are already in the transparency, produced photographically. The brown color of the hair, a touch of blue in the eyes, a rich brown dress or bodice, treated with these various colors in the same way, or the beard or moustache of a man, become rendered in an astonishing manner. Each color as it is applied must be wiped with the water-wet sponge in the same way. This takes off all excess of color, while the photograph gives all the detail required. The writer has colored a 4 x 5 plate again and again in five minutes by this method, so any person could color as many as a dozen such transparencies in an hour.

The best effect is seen when the colored transparency is dry, and especially when it is coated with a varnish which may be described as *milk varnish*, because it produces an effect as though the surface had been covered with milk, at the same time giving to the transparency a thorough protection and a water-proof covering. The total effect produced is as though the portrait was made upon the finest ground-glass with an opalescent appearance.

In producing these transparencies the water from the faucet must be strained through a large tuft of absorbent cotton, wrapped over and tied to the faucet in cheesecloth, so as to retain any grit or dirt that would strike the delicate surface of the transparency, causing scratches and other defects. Furthermore, the surface of the transparency is made slightly tender by the ammonia solution, so that care must be taken not to injure the surface. All these little precautions add to the beauty and perfection of result.

These special window transparencies may have a suitable border printed by the well-known plan of double printing, in shape either oval or square, as taste may decide.

The coloring of views, landscape or marine, may also be done in the same manner, producing surpassing results in a simple, efficient and cheap way. Prints upon the stripping paper may be fixed upon any window for advertising purposes, if only for a time, and cleaned off easily when the advertising is done with. Many a shop or store window could be used to advantage for such a purpose. The "ad" might be toned any color previous to attaching it to the window. All that would have to be done would be to moisten the surface with a very weak ammonia solution, or a weak acetic acid solution, then squeegee the "ad" upon the window, allow it to become perfectly dry, then pull the paper away, leaving the transparency upon the window-pane.

The milk varnish can be used also for making one of the finest ground-glass substitutes produceable. This varnish is made as follows:

MAKING MILK VARNISH

Oxide of zinc (Venetian or French)	120 gr.
Amyl acetate	3 fl. oz.
Amyl acetate collodion	4 fl. oz.

Grind the oxide of zinc in a stoneware mortar with the amyl acetate; add the collodion and grind all together; pass this mixture through a plug of absorbent cotton, pressed lightly into the neck of an enamelled or tin funnel, into a clean glass bottle. This will be somewhat slow in filtering, so the top of the funnel must be covered with a glass plate to prevent the evaporating of the amyl acetate. As soon as the filtering is complete the varnish will be ready for use. Carbonate of lead may be used in place of oxide of zinc if preferred; this, however, is quite a matter of taste.

Using the Milk Varnish

To protect the surface of the transparency the milk varnish may be poured in a pool upon the surface and allowed to flow first to the top corner near the body, then to the further top corner, down the farther side to the lower corner, and drained from the corner nearest to the body, into the bottle it was poured from. Wipe the excess from the draining corner, turn the plate upside down, and place it in a rack to drain and dry. or the transparency may be dipped bodily into a suitable container so that both sides of the transparency may become coated. This plan produces very fine results. The colored transparency shows to its best advantage when the varnish is perfectly dry.

The surface of these colored photographs may also be protected, and made both water-proof and washable, if they are coated with amyl acetate collodion alone. In this case the plate must be coated twice, reversing the position when the varnish is applied. This double varnishing may also be found necessary sometimes with milk varnish.

The writer has found that a mixture of boiled linseed oil, japaners' gold-size, and turpentine has proved to be an excellent thinner for the oil-colors, in this class of work causing rapid drying.

The next part of these articles will deal with the making of stripping paper and plates by a printing-out emulsion, together with the necessary toning and fixing formulæ.

(*To be Continued.*)

THE ARTISTIC USE OF THE MEDIUM[1]

POSTULATE I.—Each medium of artistic expression must have its particular quality.

POSTULATE II.—Art utilizes this particular quality of the medium employed.

IF each accepted art medium be an example of the survival of the fittest; if each accepted art medium has survived simply and solely because it has some special quality that is suitable to the production of rich effects, or brilliant effects, or of effects of tone, the true artist will choose the particular medium that is most capable of giving the effects he is aiming at; and, having chosen his medium, he will endeavor to bring out its particular qualities. It would be absurd to attempt to secure a water-color effect with oils, partly because it would mean a neglect of the fine qualities of oil-paints, and partly because a water-color effect could be obtained far better with water-colors. One does not cart manure in a carriage, nor does one go for a pleasure ride in a manure-cart, and only the lady novelist sends forth her hero to shoot partridges armed with a rifle. . . .

We saw in the last chapter that the weakness of photography lay in the mechanical drawing of detail, while its virtue lay in the delicate rendering of the gradation in the high-light, shading and shadow. The artistic use of the medium surely demands that its virtues should be utilized.

If the contrary held good—if the virtue of photography lay in the drawing of detail, and the weakness of photography lay in the tone-rendering, then the position of the worker in oil or gum-bichromate would be sound and reasonable; but the photographer who adopts one of the controlled pigment-processes accepts the mechanical drawing of the lens, while he takes the magnificent tone-rendering of photography and proceeds to manipulate it.

The gum-bichromate print that is placed, face downward, in a dish of water and allowed to develop naturally, is as much pure photography as a carbon; but what gum worker would be content with such development? No! he turns on a jet of water to wash away the high-lights, he rubs the surface of the print with a pad of damp cotton-wool or a moistened paint-brush, so as to exercise "personal control." Taken in its purity, the gum-bichromate process is rather a flat and lifeless process, and no photographer would adopt it unless he intended to manipulate the print with a spray of water, brush or cotton-wool. If the oil-print were printed mechanically with an inked printer's roller, it would probably give results that were as natural as collotype; but the oil-printer takes a stiff little brush, charges it with printer's ink, and proceeds to ink up his print by "hopping" the brush on the surface of the gelatin. Considering that he has to ink the whole surface of his print evenly, to pick up the ink where he may happen to have dabbed it too thick, to get his effect while he maintains his values, and to do all this before the gelatin becomes too dry, what earthly chance have the poor unfortunate tones?

Now, there never was a more unsympathetic draftsman than the lens; each awkward curve in the subject is recorded, each ugly angle seems to be accentuated; and as to detail—a telegraph wire is drawn as a hard black line, and a telegraph pole or a notice-board becomes the most prominent thing in the landscape. All the defects in outline (unless the gummist buries them in artificial patches of shadow), and much of the insistent detail, are reproduced by the pigment process, while each rub of the gum-worker's cotton-pad rubs away precious tones, and each dab of the oilman's brush destroys the purity of the gradations.

And what is a controlled pigment print after all?

A controlled pigment print is something that has but little of the photographic virtue of tone and most of the photographic defects of drawing.

Again, what is a controlled pigment print?

It is something that might have been done better, and executed with far greater freedom, if the photographer had only taken the trouble of learning to draw, so that he could handle a paint-brush or crayon-stump with dexterity.

---

[1] A. J. Anderson in *The A B C of Artistic Photography.*

If the sole virtue of photography lay in the accurate drawing of outline and detail, it could not be included among the methods of artistic expression; for the draftsman can draw all but the most microscopic elaborations with equal accuracy, while he can soften ugly contours and omit useless details. Photography's one and only claim to be numbered among the recognized methods of artistic expression lies in the fact that it can force the rays of light to render gradation with greater delicacy than could be attained by human manipulation.

But when the worker in controlled pigment takes the development of tones into his clumsy hands—clumsy compared with the natural development of pure photography—he robs his medium of its essential and particular quality, without offering any compensating quality that will place his craft among the fine arts. Can either the gum-worker or the oil-printer claim that their methods give better tone-rendering than several of the older and recognized arts? Can one imagine any sane artist giving up his brush or crayon to take up gum and oil, with all their limitations in drawing?

And here follows a nice point in ethics: Can the control-pigment print be termed a "photograph"? Should it not rather be called by some name that implies a superstructure of hand-made tone-work on a photographic foundation? For, although it be photography up to a certain point, at the exact point where the vital quality comes in, the tone-work is rendered by the photographer's manipulation; it is the action of the photographer's hand, and not the action of light, that creates the finish of gradation in both oil and gum-bichromate.

In the third place, controlled photography would take its proper rank and receive its proper recognition if it were regarded as a separate craft and not as photography that has been interfered with.

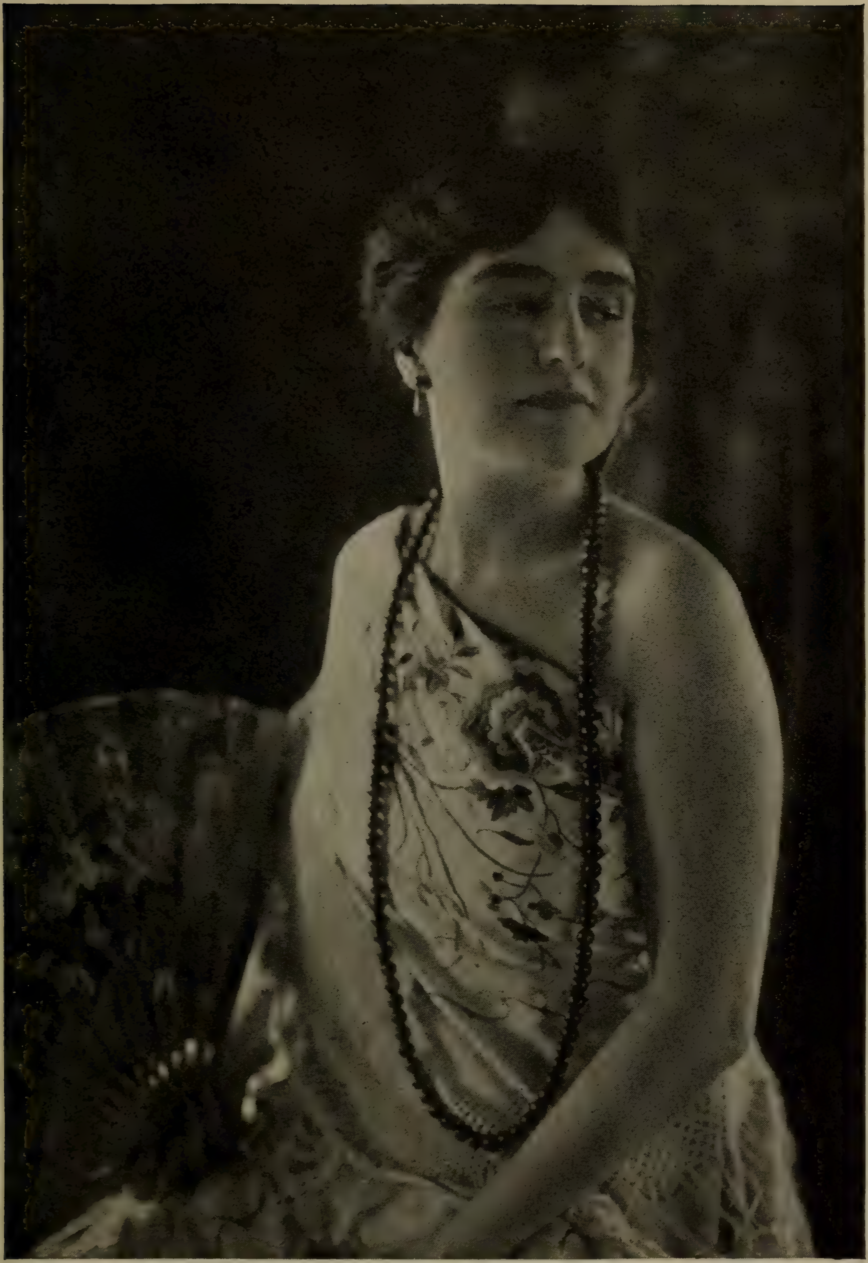
Besides, the controlled pigment process, whether in gum or oil, is a mixture of photography and manipulation, of the action of light and the action of the human hand; it is of mixed origin, and has no more right to be called "photography" than the child of an Englishman and a Hindoo has to be called a European. Since controlled pigment is a complicated process, it should have a complicated name; since it is a mixed process, we need not hesitate to mix our languages; and *Photohomography* is almost as descriptive as *Eurasian*.

After all, the artist is taking a portion of Nature that was never created for pictorial purposes, and making it into a picture. It may be necessary to strengthen a high-light or darken a shadow, so as to "pull the picture together" and keep it within its picture frame. This may be effected by chemical means, without destroying the gradations or damaging the purity of tones. But if the photographer be a wise man and a true artist, he will work so as to bring out the full quality of the medium—for this is Art.

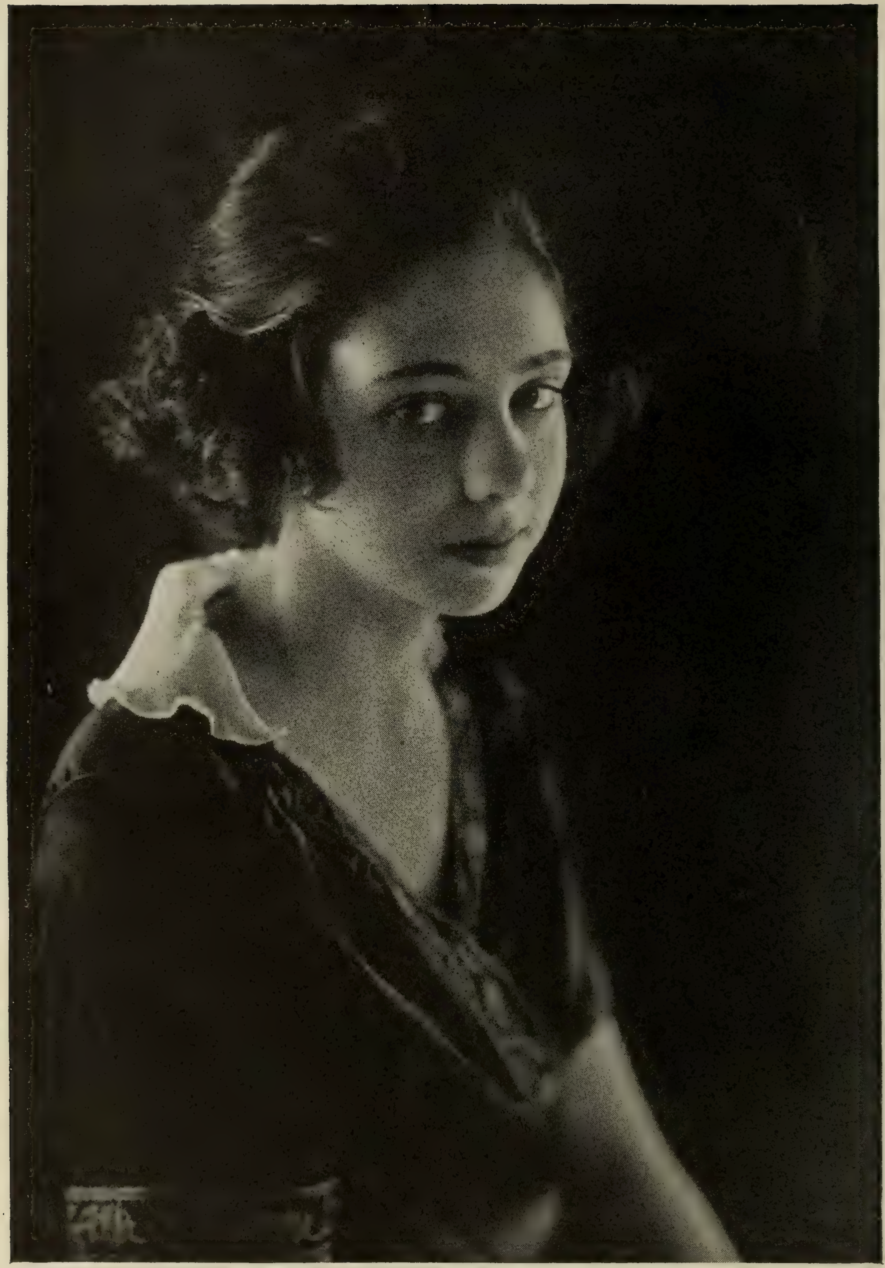
In making up developers it is important to use a good quality sulphite of soda. Obtain clear crystals or wash them if covered with a powdery deposit.

If amidol is very dark colored when bought it is stale, and, although it may do for negatives, will not give a good color on bromide or gaslight paper.

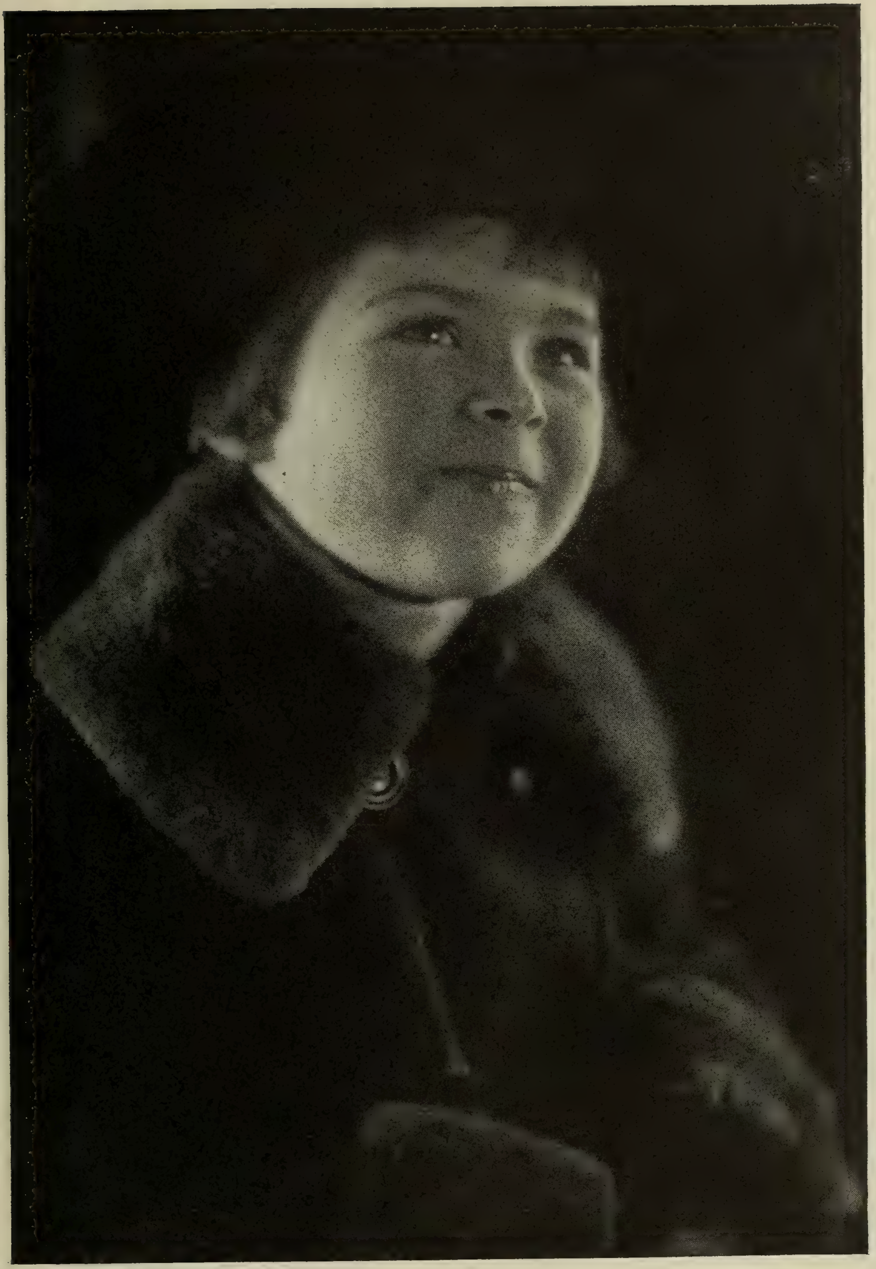
A FORMULA for simultaneously developing and fixing plates is: Water, 10 ozs.; hypo, ¾ oz.; caustic potash, 100 grs.; kachin, 100 grs.; soda sulphite, 1 oz.



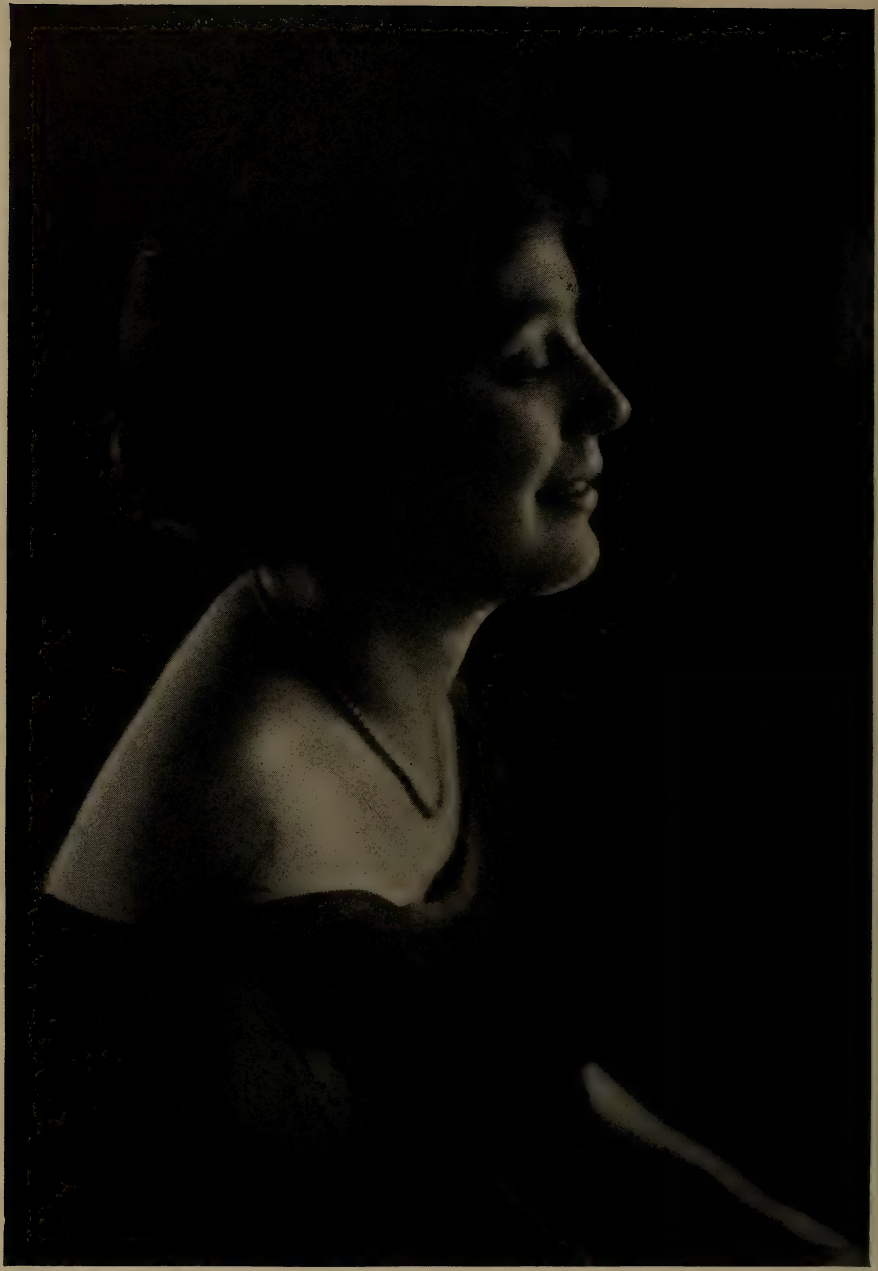
By PHOEBE ANN WHITE
OKLAHOMA CITY, OKLA.



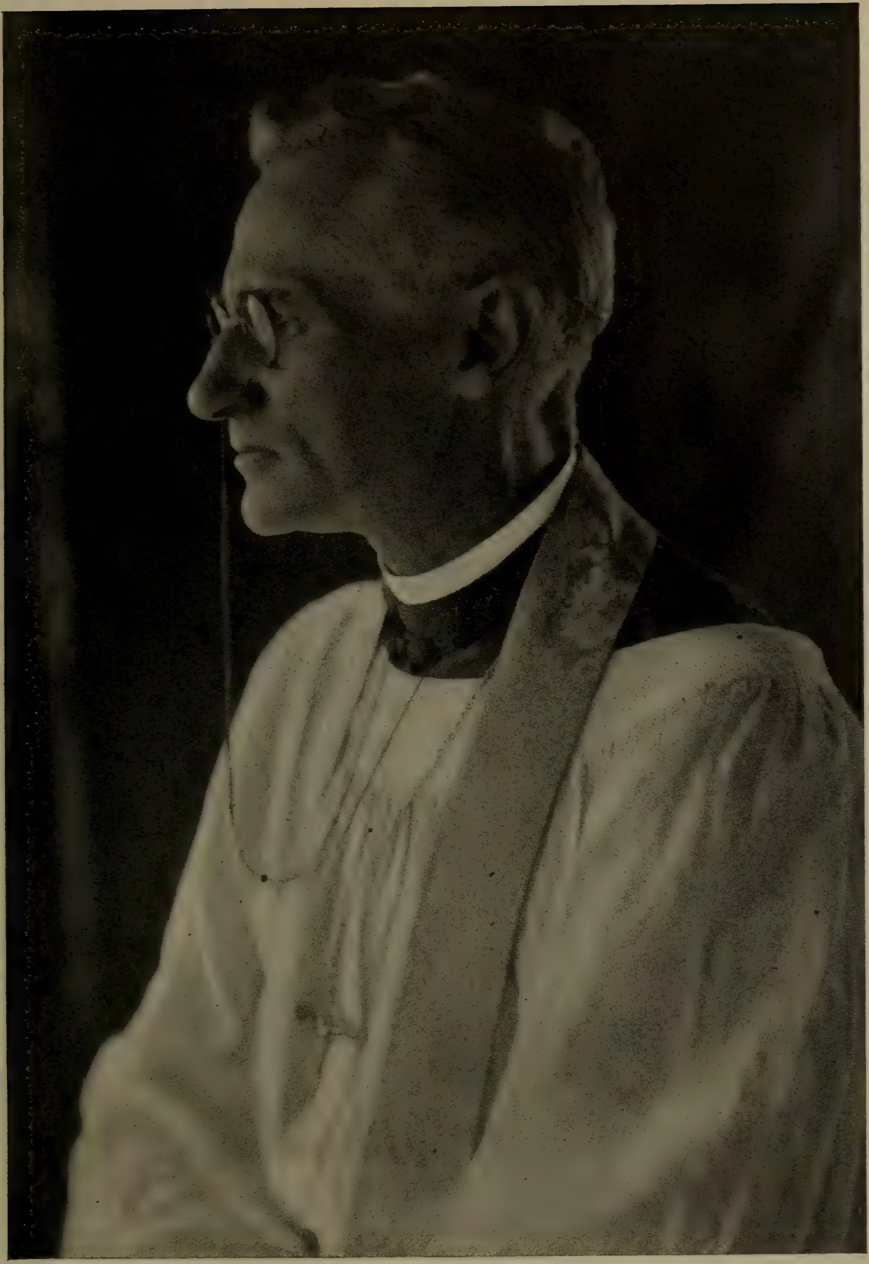
BY PHOEBE ANN WHITE
OKLAHOMA CITY, OKLA.



By PHOEBE ANN WHITE
OKLAHOMA CITY, OKLA.

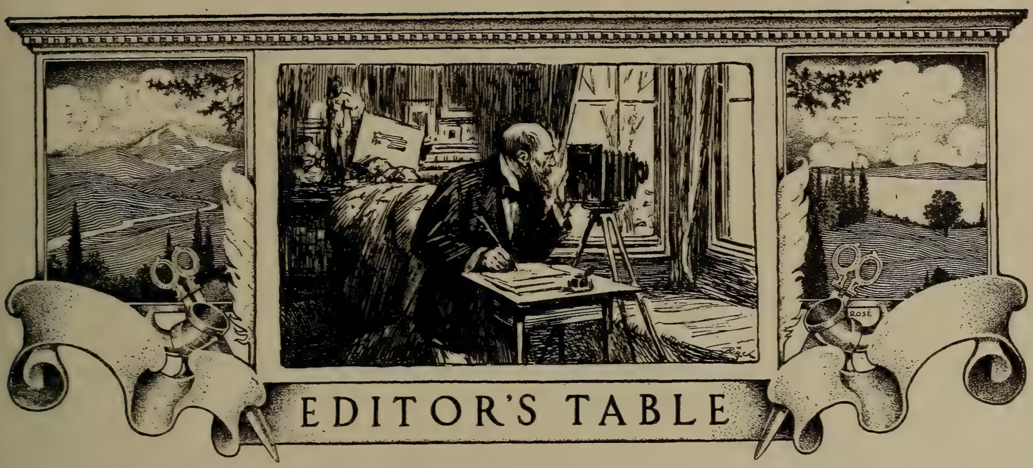


By PHOEBE ANN WHITE
OKLAHOMA CITY, OKLA.



By PHOEBE ANN WHITE
OKLAHOMA CITY, OKLA.

By PHOEBE ANN WHITE
OKLAHOMA CITY, OKLA.



EDITOR'S TABLE

1919 AND THE FUTURE

THE past year has been one of unusual activity, prosperity and accomplishment for the professional photographer. There have been some wonderful changes in methods and in results. True, the aftermath of the great war has left us with serious conditions to confront and solve, which means adjustment from the old order; but it is a time, nevertheless, when the photographer who is alert and awake to the real opportunities can reasonably expect added success to follow sound enterprise. It is, indeed, a new and larger opportunity and we would urge every ambitious photographer to realize this for himself.

Photography in America has advanced and broadened in many directions. The growing and general recognition of the value and usefulness of the Portrait Film is being more and more appreciated. One wonders these were not used long ago!

Aërophotography is now being used for many practical purposes and its field is wide. Little has been accomplished in color photography although much experimenting and some new methods have been recorded.

We are living in a period of surprise, of profound change, of marked divergence from precedent. Business has learned to go without some things entirely or to be satisfied with newly constructed products. It is the hour of the pinch hitter. Old standards are passing into obscurity and oblivion. "The old order changeth."

Do you imagine that it will ever come back? Do you believe your business, as it was before the war, will ever come back without one dandy big fight on your part?

Not much it won't. When Rip Van Winkle returned home, even his old dog had forgotten him.

Only those who have made themselves strong and fit by adequate preparation shall survive and reap the benefit. It is a timely season for calm reflection, for strong determination to put one's "house in order" and start afresh. May this New Year bring the most to the aggressive photographer who is best prepared for it.

THE PRESENT NEED

THE call of the present time in our profession, perhaps more than in some others, is for specialists. If the average quality of professional work is to be made higher and better—and of the urgent need of some such movements there can be no question—it will only be attained by the employment of workpeople who, by particular and exclusive training, have become *specialists* in the respective branches of our art.

The "all-round man," equally skilled (or unskilled) in all branches, has had a fair and patient trial and has been found wanting. The prevailing opinion among progressive workers is that the time has come when he must go. And our young men are beginning to realize that there is no hope of success unless they have mastered thoroughly *one* branch in particular of their profession.

It is a healthy sign, and we are glad to encourage it. There can be no doubt whatever but that success is certain and assured to the competent worker who can say, "This I can do, and that," and who can forthwith do it thoroughly and well.

We offer, therefore, one or two suggestions to this end for the consideration of our young men.

First, we would say to them—and the remark, although homely, is based upon our own practical experience—"Don't bite off more than you can chew." The curse of the average professional photographer is the idea, cherished most tenaciously, that he must embrace within himself *all* the possibilities of his art. Uninformed, for the most part, of the diversified qualifications essential to the attainment of skill in the widely different branches of photography, he spreads himself over an illimitable field of action, and, opening his little studio with a flourish of trumpets in the local newspaper, meets with equal equanimity the call to reproduce the smiles of mamma's (latest) darling or the vagaries of a cyclone.

These may seem harsh words to many photographers who are doing what seems to them the best they can, but our words are for the young men, particularly, who are to have charge of the studios of the future.

To them we would say, Do not attempt too much. If you can become an expert operator, a living under ordinary circumstances is assured you; therefore, bend your energies to that alone for the present. And so on with all the various branches of photography.

To one who looks forward to having at some time a studio of his own, and the charge of workpeople, it will, of course, be *advisable* to know something of all, but it will then be even more *necessary* to know *all* of some one thing.

Those who have been devoting their time to acquiring a knowledge of all the many departments of work in a studio will find much to astonish them when they give undivided attention to one branch only. They will be surprised at the amount of work which must be done in order to do one thing well.

To the making, for instance, of a good studio assistant, there should go a knowledge of light and shade, composition, the rules of art as applied to portraiture, of optics in general, and of photographic lenses in particular, of chemistry for the development, etc., of his negative, and tact in conversation and address to impress his patrons favorably. And to these there must be added the practical experience gained by steady, uninterrupted studio work for at least a couple of years.

Such a course as this, under an intelligent and efficient instructor, would insure work at all times to the person who had undertaken it.

With these suggestions we leave the matter for the present. It is a subject worthy of thought. Upon the young men now training depends the future of professional photography in this country, and we are concerned for the preparation they receive.

PRACTICAL PAPERS ON STUDIO WORK AND METHODS

Composition.—1. First Principles

Jean de Reszkè said that the essentials of voice production might be set forth on half a sheet of note paper. A statement of the real essentials of composition in pictorial work might easily be got into the same space.

If I were asked to draw up such a document I should not make more than three headings. On the assumption that the person, for whose guidance the statement was written, was ignorant of all art learning, the three headings would refer to matters he already understood. They would be these:

1. *Homogeneity*, which means that everything occurring in a picture must play some part in the design, or must be cut out if it is antagonistic.
2. *Simplicity*, which means that a picture should not be complicated with several ideas in its design.
3. *Precedence*, which means that if more than one idea should creep in, one alone must predominate, and that strongly. There is nothing here about "lines" or "radiation" or any other art shibboleth. The beginner comes to the subject innocent of art technicalities, and is only asked to keep in mind three ordinary qualities, for these headings are the names of three well-understood principles of life, and I hold that it matters not whether a man be a mechanic or a clerk or an artist; he will find them safe guides to the best results. Applied to pictures the virtue of each is that it is a short cut to the understanding of the spectator. Consider their opposites, heterogeneousness, complexity and—well, the best opposite I can think of for precedence is scrimmage, which will serve excellently. A picture in which the opposite characteristics were presented—not from intention, but because the artist could not prevent them—would raise nothing but confusion in the person who looked upon it. He would fail to see any order or idea, and he would be no more impressed with it than with a scrap-heap.

To apply the three leading principles to the art of portraiture by photography certainly requires some natural resource, if not actual talent, on the part of the photographer; but should such assets be undeveloped they may quite easily be cultivated if he will submit himself to a little guidance in a course of thought on the subject.

I have always maintained that photographers understand composition better than most things connected with art, and I write in the full sense that an apology from me ought to be sandwiched in somewhere. But assurance has been given me that the ranks of the professional are constantly being augmented by raw recruits who are, so far, only on the doorstep of the temple. They, perhaps, will not resent my attempt to be a cicerone.

Perhaps too much has been expected of composition in portraiture. There is, in reality, not much scope for it. The figure takes up almost all the space, and therefore composition becomes largely a matter of posing.

The word compose really means to put together; but if that were all there is to it, as they say in the north, there would be no chance for my three headings. It is the putting together that tries us; unless happy chance steps in, as it does sometimes, and relieves us of all anxiety. But there again is a difficulty for the beginner, should he not be able to tell which chance is a happy one and which is not.

In portraiture, composition resolves itself into taking the pose of the figure as something to go upon—a fixed factor—and then making the incidents of background and accessories conform to it, so that the result shall be homogeneous and simple, and so that the figure shall never lose its precedence or be swamped in fanciful notions such as symbolism, decoration or any other fine things under which likeness and character are often buried and lost sight of.

Let us see now whether we can get to work, I have said that the pose of the figure ought to give us a fixed factor for the composition. Suppose then we have a figure the pose of which takes in its entirety the form of a curve. That curve will be the central design idea. It must be played up to. It is the motive. Any incident that we may wish to add by way of background or accessory must not be allowed to disturb that motive by introducing other ideas to its disadvantage. Every incident should, on the other hand, support the motive either by continuing the curve in the figure or by occurring at a spot, which the curve would reach were it continued so far; or by supporting it at places in a parallel curve of its own, or, again by setting up by suggestion a twin curve running somewhere nearly in the same direction. If all the varied incidents in a portrait behaved in some such way as this in respect to the chief idea inherent in the pose it is obvious that there would be a relationship between all the parts and homogeneity would be safeguarded.

Having built up that little edifice of dicta I am now going to knock it down again, because I am afraid of its too firm and concrete character. Art is not like engineering; it deals with abstract feelings, not with concrete facts. The example I have submitted might quite easily be followed to the *reductio ad absurdum*—therefore I now say; by no means make compositions that are a series of downright arcs—unless, indeed, you wish to be the hero of the next London Salon. Positive instructions are traps for a beginner, who, working by recipe, cannot tell when he is overdoing it.

It is a fact that a composition will fail to please if its working out is apparent. The design-idea must be present in a covert way only; it should want a bit of finding. When found by the spectator it charms him, for he is pleased with his discovery. If, however, it is forced down his throat it will nauseate him.

The reader has now perhaps arrived at an understanding of the three principles first submitted and how they govern good composition. In another article they will be worked out a step further toward practicality.—F. C. Tilney in *Professional Photographer.*

Practical Suggestions

While talking with W. L. Koehne, the prominent Chicago photographer, recently, he informed me of a plan for increased prices for large work he has put into operation in his numerous studios, which he assures me has worked out very satisfactorily for himself and to what his customers have very favorably responded. The plan is as follows: His prices *were*, as *are* those of very many photographers, for 11 x 14 sheet prints made from an 8 x 10 negative.

$50 for 12;	$35 for 6;
$25 for 3;	$15 for 1,

with an additional charge of $5 for each negative finished more than one, which, should a customer have ordered twelve photos from four negatives, realized for the studio $65, viz.: $50 for the twelve prints, plus $5 for the finishing of the three extra negatives, three prints from each negative.

The new plan works out as follows: Instead of quoting prices for twelve photos, the saleslady quotes the price on three, $25, and should the customer order from four negatives, produces for the studio $100 instead of $65 as noted before. Further, if the customers should want twelve photos finished from two negatives only at the price quoted, $35, for six the amount realized is $70 instead of $55 under the old plan.

The prices are Mr. Koehne's, but any photographer, no matter what his prices are, can adopt the plan, quoting the prices *only* on three or six photos, based on *his* prices and thus realize the increased profits.—Chas. H. Kirschner, in *Professional Photographer.*

Corrosion in Lenses.

If lens users would acquire a little elementary knowledge concerning the nature and properties of glass, their instruments would stand a much better chance of keeping in good condition than they do at present. It should be known that what we call "optical" glass is made in a great variety of qualities, each of which is capable of taking its place in one or other of the many kinds of lenses. Some are as hard and impermeable as the glass we use for windows and tableware, while others are soft enough to be easily scratched or even dented, while injudicious polishing will quickly dim the exquisite surface upon the perfection of which so much depends. This is especially the case in some of the earlier anastigmats in which very soft and easily corroded glasses were used because others were not available. It is perhaps news to many people to learn that some glasses are so susceptible to damp that a single drop of water left upon the surface for a few hours will leave an ineradicable mark, while the presence of a film of condensed moisture will give rise to a general corrosion, which in mild cases shows in prismatic colors like those of a soap-bubble, and in severe ones as a yellow stain accompanied by a distinct depolishing of the surface. Unfortunately, there is no cure for this evil, for even the maker of the lens cannot repolish it to the same accuracy of figure that it originally possessed. Forewarned is forearmed, and knowing what is likely to occur the prudent man does not allow his lenses to stand about exposed to the atmosphere, but keeps them in tightly closed cases when they are not actually in use. Failing a case, which also protects the brass-work, a well fitting cap at the back as well as the front is an excellent protection.—*B. J.*

Carbon Prints on Metallic Supports, with Bright and Grained Surfaces

Generally, when the photographer desires to produce carbon prints upon a metallic support, especially upon a bright and highly polished surface, he employs a preliminary coating of normal collodion, this coating being relied upon as a substratum or go-between with the metal plate and the carbon print. This is especially so with a plate of copper that has been coated with silver and highly polished. For the production of carbon portraits upon bright copper or highly polished silver surfaces, the use of collodion is not necessary. Carbon prints upon metal surfaces are invariably produced by single transfer, so that the developing is made direct upon the metal. If the plate should be made of brass, nickel-plated copper, or a bronze of almost any description, then it is advisable to use a preliminary coating of collodion. This is necessary because the chromic acid which forms the base of the bichromate of potash (used to sensitize the tissue) attacks the zinc contained in brass, or the nickel coating on copper, or any nickel alloy, combining with the nickel or zinc and liberating copper in a free state, giving spots and patches of copper upon the surface. Collodion being an inert body acts as a neutral layer upon the surface of the alloy.

The preparation of the carbon tissue does not differ in any way from the usual practice. A very good sensitizing solution for the carbon tissue to be used may be prepared as follows:

Bichromate of potash (c. p.)	2 oz.
Distilled water	50 oz.
Glycerin	15 drops
Salicylic acid (dissolved in hot water)	15 gr.
Carbonate of ammonia . .	40 gr.

When the above are completely dissolved, filter the solution through absorbent cotton and sensitize the tissue by immersing it for three minutes. Squeegee the tissue down upon a clean sheet of glass, then suspend it to dry in a ventilated and darkened room. Having the tissue ready, it may be kept for use in a printing frame larger in size than the tissue by placing in the frame a piece of thick sheet glass covered with black paper. Put in the tissue, replace the back of the frame, and keep the tissue under pressure.

If it is desired to produce a grained surface upon, say, a plate of copper or aluminum, proceed in the following manner: Clean the copper plate well by dipping it into and rubbing it with a small rag mop dipped in a solution of lye. This solution is made by dissolving a small quantity of potash lye, about four ounces dissolved in one quart of warm water; allow it to cool off before use. The copper plate must be planished and polished previously. Having cleaned the plate with the potash lye, wash it well and dry. When dry, brush the back of the plate over with shellac varnish or asphaltum varnish. Allow to dry in a warm place. The plate should be handled by the edges only, the fingers not being allowed to touch the surface. The surface of the plate must now be rubbed well with a stick of charcoal, such as is used by photoengravers. Dip the plate and charcoal into water; lay the plate upon a smooth board, inclined over a sink so that in rubbing the surface backward and forward the surface grinding drops into the sink. The graining is produced by immersing the well-cleaned copper plate into a mixture of

Nitric acid	1 oz.
Water	20 oz.

If the graining is to be coarser, the water must be reduced to fifteen ounces.

In the course of a short time it will be seen that the surface of the copper has been attacked by the acid. Rock the tray a little, and in the course of a minute or two remove the plate, rinse it in running water, then scour the surface with a fine brass wire scratch-brush. This can be done by hand, or, if possible, use the rotary scratch-brush in a scratch-brush lathe of a silver plater. The object of the scratch-brushing is to rub down any slight burr formed by the etching of the acid. The plate may now be washed by dipping into hot water. It will dry by its own heat.

If aluminum be employed, hydrochloric acid (muriatic acid) must be used instead of nitric, because nitric will not attack aluminum except at a high temperature. The proportion of hydrochloric acid may be the same, with the addition of half an ounce of common salt. This lessens the intense action of the acid. The scratch brushing must be resorted to as before, rinsing the plate, dipping into hot water, and drying.

Assuming now that a carbon print has been produced upon the tissue in the usual way, all that is necessary will be to take the copper, silvered, or aluminum plate, and dip it in the lye. Rub lightly with a soft cotton mop, rinse in clean water, and as quickly as possible soak the exposed tissue. Dip the tissue and metal plate into a syrup composed of

White granulated sugar .	1 pound
Water	1 pint

This solution must be used only in a cold condition.

Place the soaked tissue and plate together; cover with a piece of india-rubber cloth, glazed side uppermost; place upon a level surface. Now apply a squeegee, lightly at first, then gradually increase the pressure at every stroke, not rapidly, but with a slow, heavy pressure. If several plates are used, some bright, some grained, the treatment is the same. Allow the plates to stand for fifteen or twenty minutes before developing. At the end of that period, place them in cold water, allow to soak for a minute or two, then transfer them to a larger tray containing warm water. Rock the tray so as to get rid of the air-bubbles on the surface. Take the first tray, half fill it with water of a somewhat higher temperature, take one of the metal plates out of the warm water, immerse it, then carefully lift the tissue from one corner. All that will be necessary now will be to throw the warm water over the surface of the plate with the right hand while holding the plate in a sloping position with the left hand. In a very short time the print will be fully developed. Wash it by dipping into clean, cold water; then immerse it in an alum bath compound of

Common alum	2 oz.
Water	100 oz.

The plate must remain in this bath for not more than five minutes, because the film should not be hardened too much.

Proceed in the same way with the other plates, and after the alum bath wash them by laying them in clean water from tray to tray, giving five minutes' time to soak, so as to completely remove the alum. They then may be placed in a clean rack to dry.

Carbon prints produced upon bright silvered plates have very much the same effect as daguerreotypes with this exception, the portrait may be seen at any angle, hence they have often been called daguerreo-carbons. Prints produced upon aluminum have an exquisite velvety effect, being at the same time absolutely permanent.

Better Business Suggestions

A FEW suggestions if carefully followed means better business. These suggestions come from a conference of managers of large stores in nearly every part of the country:

1. Always hold your profession as an important factor in your community and conduct the same so as to promote a high respect for all who are engaged in it.
2. Practice kindness and courtesy at all times and under all circumstances toward all with whom you come in contact, whether employers or customers.
3. Make all the personal friends in your community that you can by becoming a member of clubs, boards of trade, lodges, etc., and let these friends know that you appreciate the value of their business. Any advantage gained through personal friendship for your business is considered ethical and proper at all times.
4. We should treat our competitors with due respect and consideration, doing unto them as we would like to be done by, they are human and have the same right to do business as we have.
5. Never knock the other fellow, whether he is in the same business as yourself or in another business. Never knock his store, his merchandise his employes or his methods. *Never knock.*
6. If at any time you are temporarily out of a certain item, as a matter of service to your customer send him to your competitor for it.
7. Consult with the men in your own business and the men in other lines of business in regard to closing hours, holidays, etc. Get together and coöperate.
8. It is unwise to employ help from those in the same business as yourself or even to encourage them to leave expecting you to employ them. In case you do employ a person of this kind it is best to ascertain not only from him but from his former employer his character, his reason for leaving, all of which information should be considered absolutely confidential. Always endeavor to protect your competitors from hiring unworthy help.
9. Pay your employes just as much as their earning power will justify in your business and endeavor to keep all employes who prove themselves to be above the average in your own line of business, if not working for you, working for someone else in the same line.
10. Do not try to interfere or put out a special sale against any competitor. Any one advertising a special sale on any line of goods or photographs should not be interfered with. It is understood among business houses where they have the same goods, that the one who trims his window first with special goods has the preference and others will not advertise them at the same time. Never advertise or place signs in your window that will reflect discredit on anyone in the same business as yourself.—*Northern Photo News.*

Fact in Reception Room

As receptionist in high-class studio for fourteen years I find it much better to book orders and ask for deposit after the sitting. Larger amounts are paid and more willingly given. If a client orders a quarter-dozen only, but requires them good, don't bore for larger order before the sitting; but just whisper to the operator to be interested in this sitter and not to spare a plate. Say to your client afterward, "I hear our Mr. ——— has taken four or more negatives; he thinks you will make rather a good photograph. Now, if you would augment your order to the dozen, we would work up the extra negatives and submit all proofs to you." Result, order one dozen, deposit paid. Ask if proofs shall be sent or will they call; give them value and service. Professionals want special treatment, especially the ladies; but we can't dispute they make pictures. We have a special album made of art paper with all professional photographs glued in. You must have professional prices, seeing they seldom order less than three dozen; postcards are their general demand. The gentlemen want large heads; charge more for these, pointing out extra retouching, etc. Ask for deposit after the sitting; if they excuse themselves, saying they will call, etc., ask them to call Saturday morning; they have received wages then. Show them negatives only, saying as no deposit was paid we couldn't possibly spend time in printing, but if they would leave something on account proofs would be sent on in a few days. Send letter with proofs, stating price, etc., asking them to return proofs marked on back with the number required; also asking to enclose P. O. value the amount; and always send photographs to time, or write to apologize if order cannot be got ready; don't disappoint them. If your professional sits for photographs on Friday or Saturday, and no deposit is paid, write later saying the negatives have been developed and are very nice indeed, especially the large head or those in the pretty pink gown, etc., but that they cannot be proofed until a deposit has been sent; they are naturally anxious to see proofs; you get your cash by return and you will build up your connection with the professionals, etc.—*B. J.*

Profitable Experiments

THE typical busy photographer will tell you that he has no time for experiments, and that it is quite enough for him to do to get through his ordinary work. Therefore, he often goes on suffering loss and inconvenience to an extent which costs him ten times the money and work which a little investigation would entail. For example, his negatives suddenly go off in their quality, and alterations of exposure and development do not have the desired effect. Where is the fault? Is it the quality of the emulsion? Is it the last lot of metol substitute? or some other cause. With a little trouble it is possible to carry out a few experiments which will locate the fault. Even in these later days plate and paper makers are not infallible, and one's pet brand may not always be up to the mark. A test with another brand of plate will show whether the fault is due to the emulsion or to the chemicals used for development and fixing. If the same fault is present the chemicals are suspect, and a different developer and a fresh fixing bath, both made in small quantities, should be tried. Thus the real cause of the defect is ascertained, and the blame put on the proper parties. Often an injustice has been done to a plate-maker, and orders transferred to another firm when the plates were perfect. We can recall one instance where markings upon negatives were attributed to the plates, but were actually due to a faulty system of washing. On the other hand, it is not safe always to blame oneself and to imagine that a poor batch never slips out of a good factory. Gelatin is a very uncertain material, and changes will occur even during the process of coating plates or paper. We have recently come across several instances in which partially decomposed gelatin has caused trouble in various ways. Therefore we advise all workers who cannot get the best results by reasonable modification of their methods to check every stage, trying first a change of plate or paper, then of chemicals, and finally even of apparatus. A mysterious fogging was only traced to its source by working in another part of the dark-room. Then, when it was conclusively proved that the fog was generated in that department, a leak quite invisible to anyone working at the sink was discovered. By such simple measures as these, which are within the capacity of anyone, the isolated and often unaided worker can discover for himself what is the matter. If he will exert himself on these lines he will often be able to diagnose his failures more effectively than by referring his difficulty to, say, the editor of a paper, who, more often than not, has to guess at conditions which need to be known but are not stated.—*B. J.*

Moving the Sitter

THERE are two things in particular which make any variation in lighting laborious, the one being a fixed position for the background and the other a narrow studio. The effect of both is the same, viz., an inability to alter the lighting except by altering the blinds. When artificial light is employed the photographer often needlessly handicaps himself by having his lamp or lamps fixed so that unless he has a large studio he must be content with little control over his effects. The young operator is too apt to trust to formulæ for lighting, and takes careful notes of the arrangements of blinds and reflectors not realizing that any such arrangements will only give the desired effect at a certain time and with the sitter in a certain position. Too often after arranging the lighting he will slightly alter the pose with the effect of entirely upsetting the arrangements. Some of the most successful portraitists rarely move their blinds, finding it better and easier to secure variety, by placing the sitter in such positions in the studio as will give the desired lighting. They will use perhaps, in addition, a small head screen. Half an hour's practice upon a sitter with strongly-marked features cannot fail to be instructive. Such variations are: Placing the model near the background with, say, six feet of top and sidelight covered; then bringing him forward, say, five feet, with the camera centrally placed; then moving the camera close up to the window side, and then to the other side, the sitter keeping the same pose. These will teach more than any elaborate discourse on lighting, while every turn of the head gives further variety in each position.

It takes most people months, or even years, to learn how to make allowance for the difference between the visual value of the lighting of any object which is to be photographed and the photographic or actinic value. To a certain extent this is due to the defective color-sensitiveness of the plate, and this may be rectified by using a more or less orthochromatic plate and a suitable light-filter, but beyond this lies the actual difference in scale value which always exists between the seen and photographed images. This is usually to be seen to the fullest extent when an artist, knowing nothing of photography, lights a figure as he would do for painting and requests a photographer to make a negative of it. Almost invariably the result is disappointing, the lights being harsher and the shadows heavier than the painter anticipated. Many photographers never learn this lesson, and being on a wrong track from the beginning, imagine that the fault lies in the plate, the exposure, the development, in fact, anywhere except in the subject. A moment's reflection will show, that when we look at a subject we can take time to see shadow detail, without having the eye distressed by the brilliancy of the highlights, but with the plate this is not so. By judicious exposure and development we may secure a technically good result, but if we compare a finished print with the original under exactly the same conditions of lighting we shall see that it is not a true reproduction. Probably few photographs are submitted to this ordeal, but those workers who feel that they are not realizing their ideals will find the practice to be helpful.

ABSTRACTS AND TRANSLATIONS

BY E. J. WALL, F.R.P.S.

A New Photographic Phenomenon

ALTHOUGH the phenomenon here described has not as yet been entirely elucidated, the present preliminary note appears to be justified by the results which have already been obtained. A sensitive photographic plate is placed, film upward, at the bottom of a light-tight box; on the film are placed two or more glass microscope slides, and resting on these supports is laid a negative, also film side upward. The box is then closed and is placed in the neighborhood of a Bunsen burner, a bat-wing flame, or an electrical kettle heater. After an exposure of some hours the plate after development shows an image of the negative. The resulting photograph is the reverse of the original negative—that is, it is a positive such as would be obtained by simple printing with sensitized paper in the usual way.

In the experiments made the plates used have been Wellington Anti-screen, Imperial Extra Rapid and Imperial Sovereign makes, different batches of each kind having been employed.

The material of the box may be either wood or cardboard. Care had been taken that no light enters the box; certain of the experiments having been conducted in total darkness, while in other cases the openings between the two halves of the boxes have been carefully sealed. The results are obtained whether the box is left in the open air, or is enclosed in an air-tight desiccator.

The nature of the source of heat appears to exercise some influence on the rapidity with which the effect are produced. Very poor results are yielded by a Meker burner; poor results are given by a Bunsen flame impregnated with calcium salts, with lithium or sodium salts the effects are more strongly marked. The electric heater gives very good results when worked on its lower resistance.

The distance between the box and the source of heat has usually been about 30 to 40 cm.; but on one occasion results were obtained with a box placed in a cupboard 180 cm. away from a sodium burner, although in this case the exposure was an extremely prolonged one.

The most striking peculiarity of these experiments is the fact that when the box is arranged so that the sensitive plate lies between the source of heat and the negative, the results are obtained just as sharply as if the negative has been interposed between the heater and the sensitive plate. Were direct-acting rays concerned in the matter, it seems clear that in these circumstances the plate would be fogged by their passage through it before they reached the negative at all.

The results are not due to any radio-active material in the neighborhood, for one of us carried out test experiments in the laboratory of Queen's University of Belfast where no radio-active contamination exists and the effects were obtained there also.

The effects cannot be ascribed to the negative having stored up light which it liberates again in the dark for a parallel experiment made with a negative which had been specially illuminated for ten minutes within 15 cm. of a spectroscopic spark apparatus gave no results when no source of heat was present.

The rays which produce the effects on the sensitive plate appear to be similar in proportion to light rays. Glass is practically transparent to them; inkstains, seccotine and metal show different degrees of opacity. It has been found that the rays can be diffracted and refracted just like ordinary light.

The matter is being further investigated, but the foregoing is sufficient to show that an interesting field has been opened up.—*Jour. Chem. Soc.*, 1919.

This is probably one of the most puzzling phenomena that has been noted for a long time, all the more so in that the results are obtained when the unexposed plate is between the heat source and the negative. It is a well-known fact that in 1880 Abney photographed the spectrum and the emanations from a black kettle filled with boiling water by means of a special collodion emulsion. And twenty years ago Chapman Jones proved that some commercial plates showed a distinct band of sensitiveness in the extreme red, although no sensitizer was used. It is obvious then that were the negative in front of the plate one might have merely a true printing action as the silver image is a strong absorbent of the infra-red rays. This is readily proved by placing an ordinary motion-picture positive in the focus of a condenser in front of an arc and from actual experiment the celluloid will burst into a flame in less than three seconds, while if a positive, of the same picture prepared, as can be easily done, in an aniline dye which is absolutely structureless, will not burn in more than five minutes. It is quite feasible to explain that formation of the image, with the plate between the heat source and the plate, by assuming that the silver particles may act as reflectors, for Nichols has proved that silver practically reflects the whole of the infra-red rays, but his measurements were made with a polished silver surface and here we have black pulverulent silver.—E. J. W.

Genol and Iconyl

THE Germans soon after the war broke out instituted a very strong agitation for the Germanization of all foreign words and some of the photographic journals fell in with the idea and the photographer became a "Lichtbildner" or "light-image-maker". Now the Chambre Syndicale Française des Fabricants et Négociants de la Photographie have proposed the above names to replace the Hun terms of "Metol" and "Amidol" respectively.—*Bull. Soc. Franc.*, 1919 p. 220.

X-rays in Metallography

M. Pilon gave a most interesting lecture on the use of the *x*-rays in the examination of metals, particularly with reference to projectiles. The tube used was one of the new Coolidge (American) tubes, which he stated reduced the exposures from fifteen to twenty minutes to one-tenth of a second. He employed a somewhat novel arrangement for the sensitive surface. He used "doubles films" that is to say, a sheet of gelatin coated on both sides with sensitive emulsion. Above the sensitive film was placed an ordinary fluorescent screen, and below it a transparent fluorescent screen, and behind this a silvered mirror. The *x*-ray passed through the object to be recorded, then through the screen and the film, passing then through the transparent fluorescent screen on to the mirror and then excited secondary *x*-rays which were reflected from the silver. An excellent radiograph of a 75 mm. shrapnel shell proves the efficacy of the arrangement.—*Bull. Soc. Franc.*, 1919, p. 239.

Flashlight Mixtures

Novak's examination of certain flashlight mixtures is republished. A tube photometer was used at a distance of six meters from the flashlight and the results were as follows:

I	II	III
0.75 gm. potas. permanganate	173	0.120
1.0 gm. potassium nitrate	36	0.070
1.0 gm. barium nitrate	60	0.070
1.0 gm. strontium nitrate	84	0.105
1.0 gm. thorium nitrate	281	0.220
0.75 gm. thorium nitrate	332	0.230
0.5 gm. thorium nitrate	358	0.240
1.0 gm. zirconium nitrate	237	0.240
1.0 gm. cerium nitrate	173	1 sec.
1.0 gm. zinc nitrate	173	0.250
0.5 gm. zinc nitrate	282	0.270
1.0 gm. cadmium nitrate (basic)	399	0.300
For slow-burning mixtures		
0.7 gm. cerium nitrate 0.3 gm. strontium carbonate	160	5.5
0.6 gm. cerium nitrate 0.4 gm. strontium carbonate	140	4.5
0.5 gm. cerium nitrate 0.5 gm. strontium carbonate	125.5	4.8
0.6 gm. strontium nitrate 0.4 gm. strontium carbonate	140	1.3
0.4 gm. strontium nitrate 0.6 gm. strontium carbonate	130	4.3

In column I are given the quantities of the salts to be added to 1 gm. of magnesium powder; column II gives the chemical action in thousand candle-meter-seconds, and in column III the duration of the flash in seconds. Thorium and cadmium give the least smoke with the flashes. *Phot. Chron.*, 1919, p. 335.

Novak's paper was first published in *Phot. Korr.* 1907 p. 388 and 1908, p. 325., therefore while not new, it was thought worth while to revive.—E. J. W.

Uranium Intensifier

Whether anybody actually uses the uranium intensifier now-a-days, may be open to question, but failures are very liable to occur. It is also well-known that the whole of the intensification may be removed by long washing in ordinary tap water or by the use of weak ammonia water, which dissolves the uranium-ferrocyanide precipitated. It is extremely difficult after this operation to reintensify the image (because it is chiefly silver ferrocyanide.—E. J. W.), and now Hauberisser suggests bleaching the image in

Potassium bichromate	1 g.
Water	100 c.c.
Hydrochloric acid	3 c.c.

then developing in daylight with a strong developer. *Phot. Chron.*, 1919, p. 336.

True-to-scale Process

This process, which is known in Germany as "Fotel-Druck" and under various names in England, gives about thirty greasy ink pulls from an unwashed blue-print, is frequently used to obtain a few pulls from a line drawing or plan. Albert recommends:

Gelatin	40 g.
Water	200 c.c.
Glycerin	4 c.c.
Oxgall	6 c.c.
Iron sulphate	0.5 g.

The gelatin should be soaked in the water until soft, then dissolved by heat and the glycerin and oxgall added, and finally the ferrous sulphate dissolved in a little water. The mixture should be coated to a thickness of at least 2 mm. on a flat zinc plate that has been roughened with emery paper. When set it is ready for use. The blue-print which must not be washed, that is to say just as it comes from the printing frame, is laid in contact with the gelatin mass and gently squeegeed and left for from a half to a minute and a half and then stripped off. A smooth roller charged with litho or collotype ink is now passed over the surface, a sheet of paper laid on the gelatin rolled into contact and then pulled off and with it the image. In England a somewhat similar mass is used, consisting of 40 to 50 parts of glue, 100 water, 2 carbolic acid, 4 glycerin, to which a little ferrous sulphate or ammonio-ferrous sulphate is added.—*Phot. Chron.*, 1919, p. 245.

A New (?) Shutter Tester

Herr Kutzleb suggests the use of a tuning-fork for determining shutter speeds. Through the ends of the fork are bored two holes one of which is provided with a lens which throws the image of an incandescent lamp on to a plate through the shutter to be tested. A spiral curve is given from which by a chart or mathematical formula the speed can be deduced.—*Phot. Rund.*, 1919., p. 289.

The use of a tuning-fork is quite old.—E. J. W.

Conditions in Germany

An interesting side-light on the conditions in Germany is given by the statement that the plate makers are endeavoring to buy old negatives for recoating the glass, as "the manufacture of dry plate glass has become more difficult for our photographic factories; not, indeed, because the raw materials are wanting, but in consequence of our miserable social conditions, the want of coal and above all the existing difficulties in the manufacturing. The price for dry plate glass has risen about eight times as compared to peace times. There is the danger that the manufacturers may soon actually be unable to supply plates if corresponding quantities of old glass is not sent in." The price of silver has increased twenty times, gold nine times and platinum three and a half times.—*Phot. Chron.*, 1919, p. 334.

A New Kind of Photography

In the oldest kind of photography, daguerreotypy, the vapor of mercury was used as a developer. Now Liesegang calls attention to a process which, in certain respects, recalls the daguerreotype but which contains some distinctly novel points. The Viennese physicist Ehrenhaft has very closely studied very finely divided solid particles and has determined that under the action of light they move in the direction of the light ray or against it. Finely divided silver and mercury move in the direction of the light ray, while sulphur or selenium particles move in the opposite direction; that is, toward the light source. Water droplets are neutral to light. It would be possible to thus obtain an image by allowing very finely divided silver particles to act or drop onto a glass plate which might be coated with a slightly tacky gelatin film. The development might be carried out with nascent silver. In this way good images would be obtained with very small quantities of silver. It remains to be seen whether these momentous researches will lead also to practical results.—*Phot. Chron.*, 1919, p. 334.

Hot Weather Developer

Namias suggests the addition of 1 per cent. of tannin to alkaline developers, immediately before use. This hardens the gelatin and permits the use of a solution at 86° F. without any danger of the gelatin softening.—*Phot. Rev.*, 1919, p. 160.

An alkaline tannate must be formed and this rapidly oxidizes and is very liable to stain the gelatin deep yellow.—E. J. W.

VIEWS AND REVIEWS

Metropolitan Section, Professional Photographers' Society of New York

The second of a series of informal dinners given by the Metropolitan Section of the Professional Photographers' Society of the State of New York took place at the Hotel Astor on the evening of October 25, 1919.

The dinner was tendered to Mr. Frank Scott Clark, of Detroit. The Society also had as its guests Mr. Clarence H. White and Mr. Lajaren A. Hiller, of New York City. A full attendance of the members of the section was present.

The address given by Mr. Clark was most interesting. He spoke enthusiastically of the larger field in photography and of its relations to the graphic arts. In Detroit they have an association of the graphic arts, and Mr. Clark has been the president of it for two years.

Mr. White, who is an instructor in photography at Columbia College and an enthusiast on pictorial photography, spoke at length on his special line of work, and also told of his experience with the graphic arts and his efforts to link up photography with other crafts that use illustrations as a basis of their work.

Mr. Hiller, who has been so signally successful in his line of illustrating, using photography as his means of expression, gave some practical points along his line of endeavor.

The Metropolitan Section feels that it is doing something to create among its members a higher standard in our wonderful art by bringing to its meetings men who stand so high in the profession. It is, indeed, a splendid thing to have men from other branches of the profession and from other cities to address us; it has a broadening influence and is a helpful means of placing photography on a high level, and where it rightfully belongs.

L. L. de Anquinos,
Secretary.

Schedule of Wages and Prices for Piece Work Adopted by the Association of Photographic Workers of Chicago

L. A. Reid, President.
J. Neff, Secretary, 829 Lawrence Ave.
Berl Treskansky, Treasurer.

For Retouchers. The working week shall consist of forty-four hours, namely, eight working hours each working day and four hours on Saturday throughout the year. All overtime shall be piece work only. The minimum wage for retouchers shall be thirty-five dollars per week.

Piece work shall be paid on the basis of the inch measurement scale at 20 cents, 25 cents and 30 cents per inch, beginning at the highest visible point on the forehead down to the lowest visible point on the neck, according to the quality of the work required. Arms and other points according to fair judgment.

In the case of small work, such as figure work on plates 5 x 7, the price shall be 20 cents per figure, any number of figures.

Groups on plates 6½ x 8½ or 8 x 10 in full figures, the price shall be 20 cents per figure, for first six figures, 15 cents per figure for next six figures, and 5 cents per figure for all additional above first twelve figures. Larger groups or larger-sized heads by agreement, either by head or on inch scale, if in busts.

For Printers. The working week shall consist of forty-four hours, namely, eight working hours each working day and four hours on Saturday the year around.

There being no basis for a minimum wage scale, we demand for the present, a rate of 20 per cent. on the wages now current.

Where a printer is required to do work other than printing, such a dark-room work or assisting in or doing operating, a raise of 25 per cent. of their present wage is demanded.

Time and one-half shall be paid for overtime and double time for work on Sundays and legal holidays.

Retouching Price Schedule. Price 30 cents per inch for good retouching, and 20 cents and 25 cents per inch for lower grades of work. All measurements from highest point of forehead to lowest point of neck. Arms, hands and special work, price according to judgment.

5 x 7 negatives full figure 20 cents per face. 6½ x 8½ and 8 x 10 groups, full figure, 20 cents for first six persons; 15 cents each for next six, and 5 cents each for extra figures.

Minimum wage scale $35 per week of forty-four hours. All overtime, piecework only.

Subscriptions to Relief Fund for Photographers in Northern France Through Chambre Syndicale Francaise de la Photographie

War Fund—Woman's Federation	$500
Col. Theo. C. Marceau, 624 Fifth Ave., New York	500
Pirie MacDonald, 576 Fifth Ave., New York	500
A Friend of France	250
Howard D. Beach, 469 Virginia St., Buffalo, N. Y.	50
E. B. Core, 76 Landscape Ave., Yonkers, N. Y.	50
G. J. Hensel, 103 Wyoming Ave., Scranton, Pa.	50
Schervee, 328 Main St., Worcester, Mass.	50
Frank V. Chambers, 210 N. 13th St., Phila.	25
J. H. Gibbons, Chambersburg, Pa.	25
Castonquay, 331 Dalhousie St., Ottawa, Canada	25
George J. Kossuth, 1219 Chapline St., Wheeling, W. Va.	25
J. T. Selby, Park Ave. and Lexington St., Baltimore, Md.	25
Dudley Hoyt, 714 Fifth Ave., New York City	25
Curtis Bell, 620 Fifth Ave., New York City	$25
Harris & Ewing, 1311 "F" St., Washington, D. C.	25
Will H. Towles, 1520 Connecticut Ave., Washington, D. C.	25
Frank Scobie, Fifth and Main Sts., Sleepy Eye, Minn.	25
Carl Frey, 11 Broad St., Utica, N. Y.	20
Mate E. McGill, Central City, Nebraska	10
Evelyn Chase, Chase Studio, Polo, Ill.	10
Thos. C. Wakins, 122 East 25th St., New York City	10
E. Agler, Van Wert, Ohio	10
Taylor Studio, 97 Clinton Ave., S. Rochester, N. Y.	10
William L. Koehme, 104 S. Michigan Boulevarde, Chicago, Ill.	10
Emile Brunell, 1269 Broadway, New York City	10
Ben Strauss, Strauss-Peyton, Kansas City, Mo.	10
Sol. Young, 40 West 34th St., New York City	10
J. B. Schriever, Scranton, Pa.	10
E. H. Stone, Hamilton, N. Y.	5
M. Moustier, 124 West 42d St., New York City	5
W. E. Burnell, Penn Yan, N. Y.	5
Ed. J. Burke, Jacksonville, Fla.	5
E. L. Mix, 2291 Broadway, New York City	5
Laval & Ninnis, Fresno, Cal.	5
Maurice Tabard, Yonkers, N. Y.	5
Z. M. Bell, 123 E. Prairie Ave., Girard, Kansas	2
	$2362

An analysis of the above list shows us that the largest portion ($1750) was subscribed by *four* photographers and the balance ($690) was all that came from photographers throughout the United States.

Photographers in America have enjoyed prosperity, and it seems a sad commentary that so few should have responded to the universal appeal to keep and aid our brother photographers who risked and lost all to hold back the tide of barbarism. Through the earnest and loyal efforts of Mr. Pirie MacDonald we are able to send the French Relief Fund a sum which, while it will mean real relief, should be much larger. It is not too late to send *your* check.

Our Illustrations

PHOEBE ANN WHITE has been quietly working for the past few years and her prints have won worthy notice from many professional artists. That her work is of an unusually high order is evident, and the growing recognition she is gaining in her home town Oklahoma City, Okla., and throughout a wider sphere is justly deserving. In answer to an inquiry regarding her methods Mrs. White says:

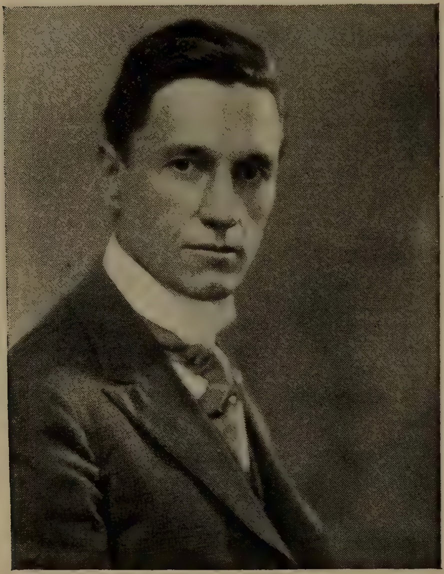
"I have done all my studying from photograph magazines and books on the subject. I have become so familiar with the work—through magazines—of the prominent photographers of the country, that I can tell almost, at a glance whose work it is. Each picture tells a story, of some one's specialty or hobby or talent. Then, too, moving pictures are wonderful studies. They strive so hard for naturalness, that any amateur can get worlds of good points, if he is observing. Of course, I am planning, after I have exhausted my own resources, to spend time studying with some professional, but right now, my keenest pleasure is seeing theories develop under my own experimenting."

Women like Mrs. White who have found their life-work in the profession of photography and who have, by patient effort, attained a laudable success in it, have proved to the world that photography holds out great promise to all women who seek a means of expressing their personality in a big way, and that it offers a career fully as enviable as that given by any other profession or occupation.

The Professional Photographic Society of New York. The New York Convention, Hotel McAlpin, New York City, February 3, 4, and 5, 1920

THE Convention this year will be one of unusual interest and profit. The following well-known people have promised to speak:

Miss Lillie Selby, of the celebrated Selby Sisters of New York City, who has made an enviable reputation for her beautiful pictures of women and children will give some of her interesting experiences.



AL. DOWNS RICE
PRESIDENT PROFESSIONAL PHOTOGRAPHERS' SOCIETY OF NEW YORK

Mr. Clarence H. White, of the Clarence White School of Photography, will give an instructive criticism of prints.

Mr. White has long been prominent in pictorial photography. His studies, both portrait and landscape, have had much to do with the lifting of photography into recognition as an art.

No photographer can listen to his talk without a better appreciation of his profession and a better understanding of the art in it.

Pirie MacDonald, the inimitable Pirie, will give us a talk on "Reception Room Tactics." It will be well worth hearing. He never wastes words, but shoots straight from the shoulder, and you'll be glad that you came to hear him.

J. Geo. Nussbaumer, a past president of the Photographers' Association of America, will give some experiences.

Wm. Cairns, the prominent photographer of Newark, N. J., has consented to give a demonstration. He is a man of unusual talents and will have something worth while to say.

Lejaren A. Hiller, a genius in the art of illustration by photography, will tell about his unique work.

Pasquale S. Culotta, expert in photography by artificial light, will demonstrate.

Make a special note of the dates and do not miss this big opportunity. It will repay you.

Price of "Monomet" Developer Reduced

THE many users of Monomet developer will be interested in learning that the Ansco Company. sole agent for this product in the United States and Canada, has put into effect, under date of December 10, 1919, a revised price-list showing a reduction of approximately 25 per cent. in the retail prices of the developer.

The new list prices are as follows: One pound, $15.00; one-half pound, $7.65; one-quarter pound, $3.90; one ounce, $1.00.

PATENT NEWS

X-ray or Roentgen plates, films, or papers; Method used and material employed in the manufacture of——. A. Mutscheller, New York. U.S. Pat 1,315,324, 9.9.19. Appl., 23.8.15.

To an emulsion is added a soluble transparent substance, which is without harmful action on the emulsion, and which on exposure to *x*-rays produces a chemically active fluorescence.

Color photography. J. G. Capstaff, Assignor to Eastman Kodak Co., Rochester, N. Y. U.S. Pat. 1,315,464, 9.9.19. Appl., 14.2.18.

A GELATIN film carrying a photographic image is prepared for staining by treatment with a bleaching solution, which also softens the films in direct proportion to the strength of the silver image.

Moving-picture films; Process of producing colored ——. M. Handschiegl, Los Angeles, Cal. U.S. Pat. 1,316,791, 23.9.19. Appl., 9.4.18.

A POSITIVE film is colored by being pressed up in a softened condition with its negative, which has been previously stained with a suitable dye solution.

The
WORKROOM

CONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

The Production of Perfect Sepias
Trays for Drying Postcards and Prints Upon
Pencil-colored Oil Transfers
Some Points in Copying—I
Time Development of Bromide Postcards
A Useful Cement
Retouching Scale
Temperature
Simple Dry Mounting : Lines Round Prints : Titles
Factors in the Blistering of Prints
Photographing Cut Glass
A Glue for Celluloid
Semi-matt Printing Paper
Wide, Medium, and Narrow Angle Lenses:
    Wide-angle Perspective
Printing upon Silk with the Salts of Silver and Iron
Self-toning Paper
Washing Prints—Some Suggestions
Bad Bromides
Dusting Plates
Notes on Gaslight Papers
Preparing Prints for Coloring
Photographing Materials and Processes

THE WORKROOM

By the Head Operator

The Production of Perfect Sepias

I THINK that the majority of photographers will agree, when I say that more poor sepia prints are turned out than black and whites. Also that the production of sepias is often associated with much trouble, waste, and ultimate disappointment. The reason is simple, for in all popular sepia processes a black and white print is required first of all. Therefore, sepsia means extra work, and secondly there is no law that a passable black and white must necessarily result in a passable sepia if toned. Therefore, sepia means more risk.

The extra work cannot be avoided, but the risk can be minimized to the point of guaranteeing twelve perfect sepias from a dozen perfect black and whites. It is only necessary to study the peculiarities of the process, and to take sufficient care in carrying it out.

The most common faults of bad sepia prints are: Muddiness and poor quality of color; double tones; spots; blisters, washiness, and "weight." This latter being that heaviness gained sometimes in drying.

Let us take them singly, and consider their most common causes and the simplest means of prevention.

Sepias that are muddy or those whose color is not pleasant may be produced in different ways. A thin or flat negative will not readily give a print which will tone well. An overexposed print may appear fairly good in the black and white stage, but tone muddy in spite of careful toning. Stale developer or an excess of bromide will also influence the quality of prints which are subsequently toned. A weak sulphide solution, or an out-of-condition hypo-alum bath will cause sepias to be poor in color quality.

To obtain a pleasing color, good negatives with plenty of body in them should be made in the first place. Fresh developer should be used for the prints and the bromide used carefully. Exposures may be on the short side but never over, unless printing on a vigorous paper from a bold negative, in which case overexposure and quick development may prove decidedly useful. If the toning is done by bleaching and sulphiding, the sulphide must be fresh and not too weak. I find a 1 per cent. solution right for most papers, but opinions differ on the point, some using stronger and some weaker baths than this. With weak solutions there is a risk of over-working the sulphide, however, and, if a quantity of prints are being put through, it is wise to keep renewing the bath. Also to soak each print separately for at least a minute before putting another on top of it.

With hypo-alum, to get the best color the bath should be just ripe, not too fresh and not too old. A fresh bath has a tendency to give pale yellowish tones, and an old one dark, cold tones.

Before bleaching a print, if it is on the weak side, a preliminary soak in the sulphide solution will have the effect of making it deeper and colder.

A flat print can be improved by adding to the bleacher an amount of potass. bichromate equal in weight to the ferricyanide.

Improved colors can similarly be obtained by soaking the prints in bichromate solution—of a fairly deep salmon tint—previous to bleaching in the usual bath.

Very cold tones may be produced by giving the bleached prints a run through amidol developer before sulphiding. The tone will depend on the time they are in the amidol; the longer it is the colder the tone.

Who has not at some time or other seen a toned enlargement marred by ugly blue-black patches? I mention enlargements rather than small prints, because the former are more liable to the particular markings, and also more likely to escape immediate destruction when stained or double-toned. Admittedly, a good worker should not pass an enlargement where he would destroy a small print, but nevertheless there seems to be a much bigger proportion of double tones among large stuff than small.

By far the commonest cause of double tones is imperfect fixation. This is why the large stuff is more likely to suffer. A dab and a push may suffice for a postcard, but is useless for a 20 by 16. A print intended for toning—or, in fact, any bromide or gaslight print—when developed should be immersed thoroughly in active fixing solution; in other words, it should be attacked all over by good, clean hypo at once. If any delay is necessary between development and fixing the print must be kept immersed in pure water or in a recognized stop bath. A bromide or gaslight that is being "fixed," in places by hypo solution and in other places by air-bells or remnants of developer, will record the position of such air-bells and developer on being toned.

The record will be in blue-black spots and patches, so the way to prevent such double-tones is obvious.

Similar markings have been said to occur owing to excess of heat when using hypo-alum, also to air-bells in the toner. In both cases prevention is easy.

"Faking" in development and local reduction of a print in the black and white stage will cause double toning, but in these cases the secondary tone will be paler or yellower than the normal.

Gaslight prints from very thin negatives are liable to tone in alternate warm and cold streaks.

Contaminated developer will cause similar markings to appear on toning.

There is one kind of double-toning which is not so obvious or so offensive. It is a peculiarity of certain papers, and consists of cold highlights and warm shadows.

Some prefer this effect to the normal, but if not liked it is easily avoided by changing the grade — not the brand necessarily — of paper. In one well-known make are two kinds of platino-matt bromide: one tones to deep brown and pure white, the other to deep brown and pale blue. In black and white they are almost indistinguishable. Another equally popular brand gives pure black and pure white, which, on toning, becomes browny-chocolate and cream. This sort of double-toning is worth cultivating.

All things photographic suffer at times from spots. Sepias are no exception. White, red, puce blue, and black are the varieties I have met and combated. Maybe there are as many other kinds as well.

White spots are caused by hypo dust knocking about the workrooms. A speck of this, too small to be seen, may lodge on the print and form Farmer's reducer when the print is bleached. Hence the white spot. Another white spot is due to over-fresh paper. This spot appears on development, and is not unlike that produced by an air-bell.

Red spots may be brought about by impurities in the water supply. A linen bag tied over the tap will keep grains of dirt and metallic matter back and helps to prevent spots. Dark spots—seen by transmitted light—in the paper itself (not the emulsion) often give rise to red spots on the surface when toning. Such paper should be rejected, or the spots kept to dark parts of black and white pictures where they will not be noticeable.

Puce or purple spots that appear during drying are due to dust. At the first sign of them the drying-room, or cupboard, or rack should be thoroughly cleaned and overhauled.

Blue spots may be caused by traces of alum in the print, when it is bleached. Any other matter capable of forming Prussian blue with ferricyanide will give rise to these spots if such matter is in the print, or the water, or adhering to the dishes. Care and cleanliness are the best preventives of blue spots. They can be removed sometimes by application of a strong alkali, or by hydrochloric acid, but their removal is not a sure proceeding at any time.

When using the copper-ferricyanide method I have often met with black spots, but have never been able to trace the cause or devise a cure. Redevelopment will, by turning the rest of the color black, cause them to disappear, leaving the print as it was prior to toning.

Blisters usually occur with delicate and poor papers, and are caused by air getting under the film of gelatin. Just how the air gets there it is not always easy to see, though some papers are so porous that a bubble imprisoned beneath a "face-up" print will percolate through the paper until it is enclosed between the paper and the gelatin.

Warm or strong sulphide solution will tend to cause blisters, as will also a falling stream of water or an over-long washing. Prints from the hypo-alum bath may be blistered by a sudden chill. To prevent these unsightly marks—which may dry down but don't often disappear totally—care should be taken with the dilution and temperature of sulphide and an anti-splash device used on the washing tap. Washing should not be protracted—ten minutes should suffice. With hypo-alum, prints should be allowed to cool down before being put into cold water. A hardening fixing bath is useful when delicate papers are being handled.

The washed-out yellowish sepia print is not a thing of beauty or one to be repeated.

It is usually brough about by insufficient care in making the black and white print, but may be due to other causes. A good print which has been correctly exposed and developed will not tone washy unless something is wrong.

Hypo in the print or bleacher will do the mischief. To guard against this, prints may have a preliminary soak in pink permanganate solution. If the pink color is not turned yellow or entirely bleached in two minutes the prints are safe for bleaching. If the bleacher is not known to be uncontaminated, new should be made up.

Fresh hypo-alum has a reducing effect. This can be corrected by ripening the bath with a few waste prints or pieces of bromide paper.

To guarantee that a print will not gain depth when toned and dried requires the consideration of at least three factors: (1) the make of paper. Some makes—and also some varieties of the same make—dry up differently to others; (2) the development of the print; and (3) the method of toning. The make and variety of paper must be studied to find out its tendency in this direction. If it tends to dry up dark, then the development must not be overdone. Sufficient exposure should be given to ensure barely full development in one and a half minutes at 65° F., using a normal developer. With extra bromide new calculations are necessary which may need experiment to verify.

Prints from flat negatives should be slightly underexposed, so that when fully developed they will look a good shade too light. When toned and dried, the print should be correct in depth and of a fairly good color. Slightly intensified results can be obtained by using the bichromate bleach on the fully developed but light print, as mentioned in the paragraph on "muddiness."—*B. J.*

Trays for Drying Postcards and Prints Upon

LARGE quantities of bromide postcards and prints necessitate some adequate means of drying. I have found no better method than laying them flat on large trays covered with mosquito netting which has been rendered waterproof by immersion in the following solution:

A

Alum	3 lb.
Soft water	160 oz.

B

Lead acetate	1 lb.
Soft water	80 oz.

Mix thoroughly, allow the precipitate to settle, decant, and soak netting for twenty minutes in the liquid. Wring lightly and hang in shade to dry. The frames may be of any suitable dimensions, and the netting is held in position on the frames by slipping the meshes over round-headed brass nails. I have had frames covered with material treated as above in continuous and hard use for the last six years without necessitating any renewal. If it is desired to dry the cards perfectly flat they may be laid face down on the netting without any fear of adherence. The trays when loaded are placed in a rack one above the another, and the whole placed in a d ying-room, or a gas ring or oil-stove may be lit underneath.

Pencil-colored Oil Transfers

THESE pictures are not transfers from oil prints inked up by hand with colored inks; they are black and white transfers colored by hand, with Hardtmuth, Conté, or Faber or other similar crayons. Therefore the action of light has no more and no less to do with the *colored* result than in an oil print inked up locally with inks of various colors—the only difference is that the pigment in my case has been added in a dry state to the finished black and white picture.

Of course, we have seen hundreds of hand-colored photographs on the market—bromides and platinotypes. I do not like them. Indeed, I have a strong dislike to that sort of picture. But about a year ago one of my intimate friends, Mr. Homère—a painter and also an aquafortist —showed me some charming drawings of his in fixed charcoal, colored in such a way with special crayons that not a particle of the charcoal picture was visible, though the underlying black image was evidently responsible for the modelling of the picture. In other words, the added pigment appeared to remain transparent toward form and not toward color, if black may be called a color, the influence of the charcoal black being perceptible only to the extent that it slightly lowers the tone of the added pigment without introducing any actually black accents to the general scheme. Mr. Homère suggested that, given the identity of both pigments—fixed charcoal in his case, transferred engraving ink in mine, pure carbon in both—it was probable that results similar to his own could be obtained by similar color work on a transfer substratum. After a few experiments we found that it was so, and by subsequent trials it was proved that the same work in color upon a bromide or platinotype print gave totally different results—absolutely devoid of the quality which remains peculiar to colored transfers.

A platinotype on rough or semi-rough paper, and still more a bromide print—hand-colored—show quite distinctly the surface coloring, AS *a surface coloring.* The pigment does not belong to the picture. But a hand-colored transfer on drawing paper or Van Gelder paper gives one the sensation of a picture in color; the pigment appears to be part of the picture. It is because of this special quality, which has been noticed by a number of painters, that I believe it is worth while to draw attention, and to explain how they are made.

First of all we must bear in mind that the quality of the underlying black and white image is of paramount importance toward the final results in color. It is only after a certain number of experiments that we can ascertain what style of primary image is suitable to this or that color effect. As a rule, all strongly inked and heavy-shadowed oil prints are ill suited to transfers intended for subsequent coloring. Delicate and cleanly inked oil prints give the best result of all. But the black and white image must in all cases be complete in the modelling, especially if figure work or nudes be attempted; otherwise the incomplete parts of the picture will have to be redrawn, and, unless the author is an expert draughtsman, it will show.

I have tried a quantity of different papers—Dutch, French, and Japanese. The best ones for this particular kind of work are the Van Gelder hand-made papers, Nos. 40, 41, 31; the Arche white unsized paper, and the Ingres drawing paper for charcoal drawing. Smooth or very finely grained papers like the Canson drawing papers take the color too evenly, and when worked upon too long show a waxed, shiny surface. One wants a certain roughness of texture—a tooth—for the color to get hold of.

The coloring part of the process does not require any special dexterity in drawing, for the underlying image serves as a guide to the pencil. But, of course, it is useless to attempt this kind of work without having seriously studied the laws of color. And one must have, more or less, what is commonly called an eye for color. For it is among delicate color harmonies that success will be achieved.

The above-named crayons having been chosen on account of the transparency of their pigment, it follows that vivid color effects like those of opaque pastel are impossible. And pastels are not suitable on account of their opacity. With pastels it is a question of redrawing the whole picture.

That is why I have followed in my work the style of the eighteenth century "dessins aux trois crayons" and "dessins rehaussés"—without attempting to reproduce faithfully the colors of nature. My aim is to suggest colors, and it is interesting to note how well a faint tint of pigment can brighten up a monochrome print, and produce quite a distinct color sensation, provided the surrounding tones are in proper harmony.

Of course, the resulting picture will be totally conventional, but what can be more conventional than the rendering of colored nature in black and white—when there is precisely no such thing as black or white in nature? Yet we have accepted this strange transcription. So there is no reason why photographers should not accept one which is still less conventional after all, for it is partly true.—ROBT. DEMACHY, in *Amateur Photographer.*

Some Points in Copying—I.

THE trouble often made of the work and the indifferent results frequently produced render it unnecessary for us to make any apology for dealing with a somewhat elementary branch of trade work. We may, however, point out that the poor results are often the natural outcome of the attitude. A copy is out of the run of the regular studio work. It often means a disarrangement of the studio, in the midst of which a sitter arrives, and in some cases the apparatus used for portraiture can only be regarded as a sort of makeshift for copying. In our opinion, it would pay in most businesses to give some special attention to copying, and to prepare striking examples of fine copies from desperately faded, yellowed, stained, and broken originals. Probably every photographer could find such originals, and a little red or yellow dye might be used to produce a stain. Few of the public have any idea as to what may be done with panchromatic plates and contrast filters; nor is it necessary to enlighten them, except by showing the results. But these results must be genuine—that is, the red ink must be put on the old photograph *before* it is copied!

Any organized campaign for capturing copying work should be planned with all kinds of copying in view—photographs and paintings, of course, but also documents, plans, old MSS., and so on. Such work necessitates the use of two copying cameras—one, say, taking plates up to 15 x 12, and providing an extension of from 4 to 5 feet, and the other a whole-plate camera, with an extension of about 20 inches. The whole-plate camera would be used for the ordinary everyday copying of prints, mostly to the same scale as the original, and an 8-inch or 10-inch lens would serve well for such work, bearing in mind that, while it need not do more, *the lens used must cover the smaller of the two images*—that is, in copying a half-plate print to whole-plate any lens will serve which will cover a half-plate. But if a whole-plate is being copied to whole-plate, then a lens must be used which will cover whole-plate.

The large camera will require several lenses, from one of long focus, say 20 inches, and capable of covering 15 x 12, downward. In most cases these lenses are at hand, and they need not be modern anastigmats, good R. R. lenses answering the purpose quite well. If a lens has to be bought, and it is likely to be kept employed for copying work, some of the earlier anastigmats are worth consideration, such as the Ross-Zeiss, Series III, working at *f*/8. These are admirable lenses, and cover well any plate whose length is equal to the focal length of the lens. Of older lenses, which may be got more cheaply, the Dallmeyer triplet is excellent for copying. It works at *f*/10, and we used one on a 12 x 10 camera for many years with satisfaction.

It may be thought that an extension of 50 to 60 inches is unnecessarily long, and that such extreme work as copying a quarter-plate print up to 15 x 12 might be accomplished with less extension. Thus, copying four diameters (nearly) with a 5 inch lens, we only require an extension of 25 inches. True, but the lens will be only a fraction over 6 inches from the print and the camera front only 7 inches, and in such conditions it is not possible to get good illumination of the original. We should not only use a 10-inch lens, but we should have an extension cone, tube, or pyramid 10 or 12 inches in length, and with a front only just large enough to take the flange of the largest lens in use. This arrangement, with the 10-inch lens suggested, would keep the camera front something like 24 inches away from the original on the copy-board in the case suggested. It is then possible to illuminate the orignal with light falling on it at an angle of about 45 degrees, so avoiding reflections on the one hand and the getting of a granular result on the other.

Reflections are always a potential source of trouble, and they are usually avoided by the use of the longest focal length possible—of course, within reason. But care must be taken to avoid too flat a lighting, or the side of the original nearest to the window may give evidence of reflection. In certain cases this reflection may not be very obvious, as for instance, in the case of a pencil drawing where the pencil-lines might be "shiny." But once the general positions of light, camera, and copy-board have been determined, little trouble should occur.

While we do not think a swing back is essential, it is an advantage because sometimes it will happen that a distorted original has to be copied, and then the swing coupled with a tilt of the copy-board will enable correction to be made. Rising and cross fronts are not necessary, for the copy-board should possess these movements, since they enable the image to be centered on the ground glass very much more rapidly. When an operation has to be performed hundreds of times in a year, it is a positive economy to spend an extra dollar or two in this way, for the money will be more than saved in time, to say nothing of greater inconvenience, which saves irritation and prevents the "Oh, that's near enough; it will have to do" feeling which militates against the production of the best results.

One of the chief difficulties in copying—at all events, as soon as a same-scale or larger-scale image is required—is the focussing. To eliminate this difficulty entirely three things are needed: (1) That the camera has back-focussing; (2) that it may be moved bodily, by sliding along a suitable board nearer to or further from the copy-board; and (3) that the simple rule for obtaining the conjugate foci is used before beginning the work. Put in another way, these three points amount to this—that the easiest way of obtaining the correct size and proper definition of the image on the ground-glass is to calculate the conjugates, and then, for setting the apparatus at these conjugates, back-focussing and sliding the entire camera are the convenient time and labor-saving methods. Even if fractions are involved, the calculations is simple, and will take less time and prove less exhausting than trial and error methods with the camera.

Suppose we have to copy a c.d.v. direct to whole plate, and that the print is $3\frac{1}{2}$ inches long. We first obtain the times of enlargement, *i. e.*, the number of times $3\frac{1}{2}$ will go into 8 inches, which is the working length of our whole-plate. This, of course, is $8 \div 3\frac{1}{2}$ or $\frac{16}{7}$. To this *add* 1, and then *multiply by the focal length of the lens.* 1 is $\frac{7}{7}$, so $\frac{16}{7} + \frac{7}{7} = \frac{23}{7}$. Suppose the focal length to be 8 inches then $\frac{23}{7} \times 8 = \frac{184}{7}$, and dividing 184 by 7, we get $26\frac{2}{7}$ inches. This is the conjugate inside the camera, and, assuming we have an extension cone for it, our whole-plate camera will answer our purpose. We may, if we like, obtain the other and lesser conjugate by dividing the greater by the times of enlargement, *i. e.*, $\frac{184}{7} \div \frac{16}{7}$, which equals $\frac{184}{7} \times \frac{7}{16}$. Cancel out the two sevens, and we get $\frac{184}{16} = 11\frac{1}{2}$ inches, the distance from the lens to the original. But it is not necessary to calculate this lesser conjugate, because, having set the camera extension so that it is $26\frac{2}{7}$ inches from the diaphragm to the ground-glass, we may get our image sharp by sliding the entire camera forward toward the copy-board. This is quite easy with a whole-plate camera, though not very convenient with a 15 x 12. When using the larger size, then, it is well to calculate the lesser conjugate, and set the distance correctly. It will then be found a great advantage to have the copy-board adjustable for distance, if possible, by rack and pinion, so that fine focussing may be done by moving the original. This method of focussing is not open to objection when the greater conjugate is set, and is quite different from the employment of a front-focussing camera, which alters both conjugates simultaneously.

In order to work this method satisfactorily, it is necessary to know the focal length of each lens in use within a very small margin of error, Strictly speaking, the position of the nodes, also, should be ascertained, and the conjugates measured from them. But for every-day work, and using symmetrical lenses, whether R.R.s or anastigmats, we can get along very well by taking our measurements from the diaphragm slot, though this gives, with the lens focussed for infinity, a measurement slightly in excess of the equivalent focal length. Having at hand suitable cameras, we may find the focal length by focussing up with great accuracy a same-size image, and then measuring the distance from objects to ground-glass, divide by 4. The best object is a postcard cut in two lengthwise, pinning one piece to the copy-board and using the other for gauging the same scale image. Here, again, there is a small error, because the internodal space should be deducted before we divide by 4. It is not difficult to measure this. But, as we have said, with symmetrical or very nearly symmetrical lenses the rough measurements will answer our purpose. Once the image on the ground-glass is obtained of almost the correct size by the methods described, it is comparatively easy to make slight adjustments if an exact scale of reproduction is required. Thus, if the scale is too small, the camera may be racked out a trifle, thus increasing the major conjugate, and focussing again performed by shortening slightly the minor conjugate.

We have dealt with copying on a larger scale because such work presents most difficulties when approached unsystematically, but in point of fact we always calculate the conjugates when making a copy on a smaller scale unless the reduction happens to be a very considerable one. It is done so quickly and in so many cases by mental arithmetic that one acquires the habit of making the calculation while getting things ready.

Where possible, the copying camera or cameras should be kept set up ready for immediate use, not in the studio, but in one of the workrooms or a corner of the printing-room. This is on the assumption that some copying work will have to be done each day. Even where this is not possible, or where the work is more occasional, the use of the methods suggested will save much time.—*B. J.*

(*To be continued*)

Time Development of Bromide Postcards

THE following method of developing considerable batches of bromide postcards, and also prints, if necessary, is the outcome of a considerable period of gradual evolution of a workable system. It is based upon a fact either not generally known by the average photographer, or, if known, regarded as of little importance; the fact that a properly exposed bromide print cannot readily be overdeveloped. By "properly exposed" is not meant a conditional exposure, one near enough correct to give a reasonably good print if development is stopped before the whites are discolored, or, if underexposed, carried on long enough to force out sufficient detail to suffice. A properly exposed bromide print develops gradually, as does a properly exposed plate, and, when all detail is out, merely gains in intensity, so that a couple of minutes' overdevelopment does not suffice to ruin a print. By careful observation and experiment I found that, with the cards used, eitht minutes was a suitable time for development for my purpose, and this has now become my standard time of full development. My negatives are printed in sets of five, and fifty from each are printed without a change. A test exposure is made if any doubt exists as to the right exposure, and the prints should be fully developed in five minutes. For development the prints are placed one after another in an amidol bath until about thirty have been accumulated; this occupies forty seconds or less, according to expertness. Note the time by the clock and commence turning the cards over—*i. e.*, face up, starting with the top or last card placed in the bath. By the time the bottom card of the pack is turned face up on the top it will, if matters are all right, be found that the deepest shadows are well seen. Go through the pack again, card by card, until each has been a second time turned and all are evenly saturated with developer. This has occupied about four minutes. Lift the entire block out, slightly drain, and place on a levelled surface. Now commence, *de novo*, with another thirty cards; at the end of four minutes this second block is ready for removal, and the first, having had eight minutes, are finished and ready for the washing water. Handled like a pack of cards, they are quickly separated one by one and dropped in a tray of water. Where different subjects are printed simultaneously it may happen that some one subject requires a little longer development; these are sorted out when throwing the cards into the washing water and placed on one side for an extra minute or two of development. When expertness has been required in working the above method it is extraordinary how regular and punctual the timing becomes, and though it may be necessary to work into the system with the aid of a clock, this afterward becomes quite unnecessary. Of course, if a change of card or developer upsets the controlling factors a readjustment becomes necessary. The evenness in depth of prints made by this method is quite remarkable. If the emulsion with which the cards are coated is one that develops slowly, three packs may be kept in progress simultaneously.

It is obvious that the developer used is not one of maximum strength, and it might be thought that a diluted developer impaired the vigor of the image. With good cards this certainly is not the case. Further, black bromide cards are not much in demand, and toning is rather facilitated than otherwise by the use of a weakened developer. The formula in use is:

Sodium sulphite	1000 gr.
Diamidophenol	100 gr.
Potassium bromide	20 gr.
Water	60 oz.

To commence development, seven parts of this are taken and diluted with three parts of water. In this the cards take the standard time of five minutes *for the test cards.* After each batch of thirty cards is removed, the solution remaining in the tray is strengthened, and bulk kept up, by adding about two ounces of the stock solution. The difference in time of development between the test cards and the bulk is necessitated by the fact that development is somewhat retarded in the pack by lack of solution, so allowance has to be made for this fact.

The above particulars are an exact description of my own procedure, but it must be apparent that the precise particulars might not apply to every make of card or paper. It would be necessary for each worker to make such modifications as were necessary to suit his own material and personal equation. Once mastered, and familiarity in working it acquired, no one who has considerable batches of developing to do would, I think, willingly go back to developing a few cards or prints at a time. It is equally applicable to strips or single cards.

A Useful Cement

The "Diamond Cement" for which the formula is here given is an extremely handy cement to have on one's shelf. Soak and dissolve in 3 ounces of water 1 ounce of soft gelatin, add $1\frac{1}{2}$ ounces of spirits of wine and 40 grains of gum ammoniacum triturated in $\frac{1}{2}$ ounce of water. Finally, 36 grains of mastic dissolved in $\frac{3}{4}$ ounce of strong alcohol is added. When required for use it must be dissolved by standing the bottle in hot water.

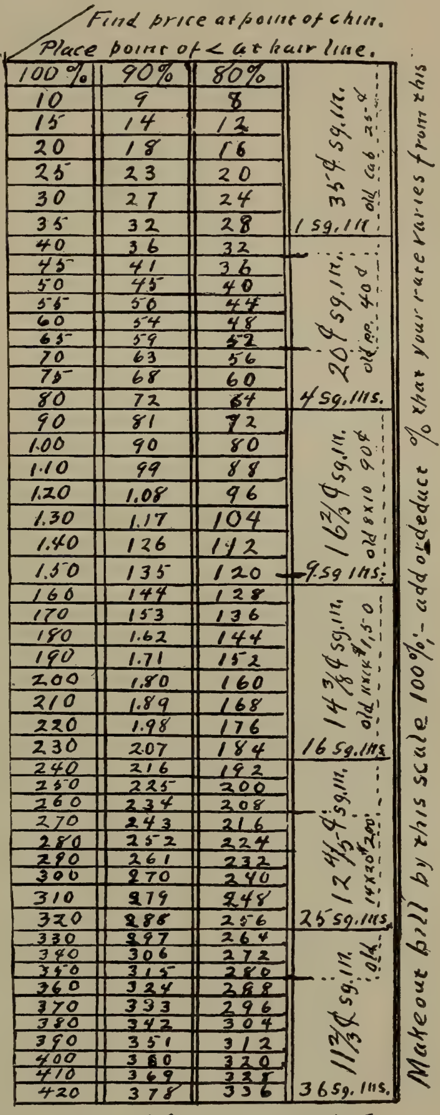
Retouching Scale

Both photographers and retouchers, will doubtless welcome a scale that will enable them accurately to appraise each size of head, on a basis of actual area covered by the lead.

Retouching rates that have become established by custom follow the gradual increase in area, with an every decreasing price per square inch.

This scale is based on the price per square inch, obtained from records and sample prints of twenty years ago. There being fewer sizes, in those days, rates were nearer a comprehensive standard than the rates of today.

The old prices are indicated on dotted lines at the margin of the scale, 60 per cent. There are three schedules in the scale, as follows: 80 per cent., 90 per cent. and 100 per cent.



Find price at point of chin.
Place point of < at hair line.

100%	90%	80%	
10	9	8	35¢ sq. in. old cab. 25¢ 1 sq. in.
15	14	12	
20	18	16	
25	23	20	
30	27	24	
35	32	28	
40	36	32	20¢ sq. in. old pp. 40¢ 4 sq. ins.
45	41	36	
50	45	40	
55	50	44	
60	54	48	
65	59	52	
70	63	56	
75	68	60	
80	72	64	
90	81	72	16⅔¢ sq. in. old 8x10 90¢ 9 sq ins.
1.00	90	80	
1.10	99	88	
1.20	1.08	96	
1.30	1.17	104	
1.40	126	112	
1.50	135	120	
160	144	128	14⅜¢ sq. in. old 11x14 1,50 16 sq. ins.
170	153	136	
180	1.62	144	
190	1.71	152	
200	1.80	160	
210	1.89	168	
220	1.98	176	
230	207	184	
240	216	192	12⅘¢ sq. in. 14x20 2.00 25 sq. ins.
250	225	200	
260	234	208	
270	243	216	
280	252	224	
290	261	232	
300	270	240	
310	279	248	
320	288	256	
330	297	264	11⅔¢ sq. in. old 36 sq. ins.
340	306	272	
350	315	280	
360	324	288	
370	333	296	
380	342	304	
390	351	312	
400	360	320	
410	369	328	
420	378	336	

Make out bill by this scale 100%; add or deduct % that your rate varies from this

Add 20% for low necks.
Add 40% for draped busts.

The 100 per cent. schedule does not keep pace with the inflation of our dollar, but is the schedule of the west today.

Should you not find, in any of the three columns, the schedule that prevails in your town, make out your bill, using the 100 per cent. scale, then add or subtract from the total the percentage of difference.

Correspondence of price and size are correct in the scale.

Piece work retouchers, whose earnings have mysteriously varied from week to week, will find, when using the scale, that one week's earnings are much like another.

Such fluctuations are more often the result of wild guessing of tolls, than variation of speed.

Photographers can apply the scale to the output of retouchers employed, on salary, and perhaps, learn that piece work, appraised by a standard scale; is more satisfactory for all concerned.

The scale was made to fit a column of the Journal, and is herein accurately reproduced.

Cut it out and give it a fair trial, and you will doubtless continue to use it until a better one is devised. If such be devised.

We certainly need a national standard of retouching prices.

If you like this scale: write to the "Journal." They have the plate, and may, perhaps, be persuaded to make copies of it, on some more durable material.

Ed. Hathaway.

Temperature

The importance of keeping solutions at an even temperature is still far from being fully appreciated by the majority of dark-room assistants. There are many who are most scrupulous in weighing and measuring their chemicals, when making up a developer, but who seem to think that once the solution is made up it is a matter of no importance at what temperature it is used. Guessing the temperature of the developing solution is just as detrimental to the making of good negatives and good prints as guessing the quantities in making up the developer.

Nearly every assistant knows that a cold developer acts slowly and a warm developer acts quickly, and he seems to think that this is the only effect temperature has upon the developing solution. If this were the only effect of changes in temperature, the danger would not be great. But there is a change in the chemical action as well as in the speed of action when a change in temperature takes place. This fact has led manufacturers to determine the temperatures at which solutions will give the best results.

The effect of temperature varies very much with different developing agents. For instance the effect of temperature on elon is very small, while on hydroquinone it is very great. A developer made up of elon and hydroquinone may have these two agents balanced to a nicety for use at a normal temperature of 65° F. Reduce the temperature, and the hydroquinone action will slow up, but the elon action will be very little affected; so that the developers will behave exactly as though it contained an excess of elon. Raise the temperature, and the hydroquinone action will be increased far more than the elon action, and the developer will behave as though it contained an excess of hydroquinone.

This explains why prints from the same negative, on the same paper and developed with the same developer, may be lacking in uniformity. Of course, the paper usually gets the blame, but as a matter of fact, it is rarely at fault. When you find your printer using a developer at temperatures varying as much as 15° or 18° from time to time, you may rest assured that there will be a corresponding variety in the quality of the prints he turns out.

Another trouble is the fogging of plates and films. All developers will produce chemical fog, if development is continued long enough, but fog is produced much more quickly as the temperature of the developer is increased. A developer that will develop a plate or a film to a good density with practically no trace of fog at normal temperature, may produce a very bad fog if the temperature is raised 10°. On the other hand, when the temperature of the developer is very low, the effect of underexposure is produced; and it should be borne in mind, that a developer which is too cold cannot be corrected by the addition of more accelerator, such as carbonate of soda. This would only produce fog, and most probably cause the emulsion to frill or blister.—*Professional Photographer.*

Simple Dry Mounting: Lines Round Prints: Titles

The process of dry mounting is one of the neatest of methods, which does not call for any great degree of skill or knowledge, and so is quite within the reach of the beginner.

The principle on which dry mounting is carried out is a very simple one. Various resinous substances, of which shellac is the best known, soften and become sticky under the influence of heat. A piece of thin tissue paper impregnated with such resins is placed between the print and the mount, and pressure and heat are employed to bring the whole into close contact, with the result that they adhere.

There are great advantages about such a process. Everyone who has glazed prints by squeegeeing and drying them on some polished surface knows that if those prints are subsequently mounted with paste of any kind, the moisture from the adhesive destroys a good deal of the glaze which the surface possessed. There is also the trouble with mounted prints curling, which seems to be inseparable from the use of mountants containing water. With dry mounting the gloss is practically unaltered, and the mounted print has no tendency to curl. There is also the advantage that between the print and the mount there is this impervious layer of resinized paper; so that, if there were anything deleterious in the substance of the mount, it would be prevented from making its way through to the print. Altogether it will be seen that a strong case can be made out for the dry mounting process.

Nor is there anything serious to be put against these advantages except that when many large prints have to be mounted, a hot press of a special and comparatively expensive type has to be bought: quite small prints can be mounted with the ordinary domestic flat iron, though this is not so easy as when the proper press is used.

The only material or apparatus which the photographer who wishes to do his dry mounting on a very small scale need obtain, is some of the dry mounting tissue. He will require also a clean poker or soldering iron, or an old screw-driver in a wooden handle, a flat-iron and means of heating it, and the usual requisites for trimming his prints. He will then be fully equipped.

To mount a print, a piece of the dry mounting tissue, about the size of the untrimmed print, and the untrimmed print itself, are taken, the tissue is laid in position on the back of the print, and is then just touched with the soldering iron or other tool, the end of which has been made hot. It must not be hot enough to scorch the paper; all that is needed is that it shall be hot enough to make the tissue in that spot adhere to the print. All the prints to be mounted can be treated in this way one after the other. The tissues will then be found adhering so that each print and tissue can be trimmed together; and this constitutes the next stage in the operation.

Taking a print with its adherent tissue, it is next adjusted on the mount in the precise position which it is to occupy; and when this has been found, the print is held down firmly by one edge, so that it cannot shift, and the other edge is lifted away from the tissue, and while this is done, the tissue lying on the mount is touched with the hot iron as before. The result of this is that the tissue adheres to the mount also; so that the print itself is held on the mount in the correct position, because it adheres to the tissue in one spot and the tissue adheres to the mount in another. All that remains to be done is to apply the heat and pressure, so that both print and mount will adhere to the tissue all over.

As already pointed out, large prints require a special apparatus to do this; but in the case of quarter-plate prints, or smaller ones, the flat-iron can be used. The important thing in this operation is the heat of the iron. If it is too hot, the print will not adhere to the tissue; if it is too cold, the tissue will not adhere to the mount.

The correct temperature will be found to be about that which is used domestically for ironing linen, and when the process has been used a few times, there will be no difficulty in deciding this. At first, the behavior of the print itself, as just mentioned, must be used as the guide.

It is usual to put down on the face of the print before ironing it something to keep it from actual contact with the metal. Some workers recommend a piece of clean paper for the purpose, but a sheet of very thin brass (stencil brass) is better, as the paper is not a good conductor of the heat. The iron must be pressed down very firmly and slid along the brass until the whole print is covered by it, and it should be kept well pressed down for ten or fifteen seconds, and may then be lifted.

If the print is not properly adherent all over when the iron is raised, the operation is repeated with such alteration of the temperature as may be indicated. If a single print only is to be mounted, the iron may be left on it undisturbed until it goes cold.

Dry mounting is particularly convenient when prints are to be put into albums or scrap-books, as the print can be stuck down without any of the cockling which follows the use of paste.

The appearance of a mounted print can often be improved by ruling lines round it. This must be done very neatly, if it is done at all, as any untidiness or inaccuracy in the lines will be very evident at once. Many a well-mounted print has been spoiled in the attempt to make it look better by such treatment.

The lines must not be put down just anywhere, but with a careful consideration as to the most suitable position for them to occupy. It will be found that they serve their purpose best if they are only a very little distance from the picture, so that by far the greater width of mount lies beyond them. In this respect they may be regarded as being on all fours with the narrow band of inner mount when two mounting papers are used, and are governed by the same considerations.

For instance, when a line is ruled all round a print—unless it is very close indeed to the print, say not more than a sixteenth of an inch from it, preferably less—the space between the line and the print may be equal at the top and on the sides, but should be greater at the bottom. Again, if two lines are ruled, they should be kept close together, so as to form one system, as it were, and the interval between them should not be the same as the interval between the inner line and the print, nor any exact multiple of it. It is difficult to say why such an arrangement would be unpleasing, but the fact remains that it is so.

The most common fault that is to be found with lines ruled round a print is that they are far too insistent. One often sees a print upon a light mount, with black lines ruled round it, while less frequently, but still often enough, a dark mount is "decorated" with lines in Chinese white. Even more glaring cases are not uncommon, as, for instance, when the lines are done in writing ink, the blue-black tone of which clashes most unpleasantly with the tone of any form of photograph with which I am acquainted.

Lead pencil provides a very good medium for this purpose. If the mount is a light one the pencil lines on it can be kept very light, while if it is a dark one they may be made heavy. In either case they are not usually out of harmony with the tone of the mount itself; probably because the pencil line never quite obliterates the color of the mount, which therefore shows through it.

The exact position which the lines are to occupy should be measured off and marked out, not guessed, giving particular attention to making neat joins at the corners. It may seem needlessly elementary; but I may be forgiven for pointing out that for neat and accurate ruling a cylindrical ruler should not be used, unless the work is to be done with an ordinary pen. The straight edge should be something that can be put right down flat on the mount and adjusted carefully to the guide marks that have been made. The pencil, instead of being sharpened to a conical point, is better if sharpened to a flat or chisel point, which is then put flat against the straight edge.

When pencil is not used, the ink for the lines should be water-color mixed up to harmonize with the tone of the mount and of the print, and kept very close in depth to that of the mount. For example, black lines should never be ruled except on very dark mounts and white lines only on very light ones. Where a line is to be lighter than the surface on which it is ruled, we must use "body color." That is to say, the pigment must be mixed with sufficient Chinese white to make it perfectly opaque. In doing this it is important to try the effect and to wait until the ink is dry, as it changes on drying. Chinese white by itself has a bluish tinge, which makes it unsuitable for use, even for white lines, without the addition of a little water-color of some warm tint.

A word of caution is necessary on the subject of ruling lines round prints against anything in the nature of fancy work and over-elaboration. Even rounded corners should not be used, while curved lines, unusual shapes, and anything savoring of free-hand decoration, should be carefully avoided. All these are too assertive; they take attention away from the photograph itself, and give rise to the impression that there is a straining to make it ornamental, or rather ornate, which is not in good taste. One cannot keep anything of this kind too simple or quiet.

It should be remembered all the time that we are not decorating the mount—decoration on it is out of place. The purpose served by the lines is to keep the attention within them, to bound the picture, and so allow it to be seen isolated from its surroundings; and nothing more.

There is one other subject which may be considered in this connection, and that is putting a title on the print. As a general rule, it is better to have the title on the back rather than on the front. The photographer must be able to do lettering very neatly indeed if he can put it on the face of the mount in such a way as not to be a blemish. Even advanced workers often make a mistake in this direction, and many a print at the Royal Photographic Society's exhibition, or at the London Salon is disfigured by the way in which it is titled.

If the title must be put on the front, then the remarks which have just been made with reference to the ruling of lines round the print apply. Pencil is as good a medium as any. The extreme bottom left-hand corner of the mount is the position where the title is least likely to be aggressive. Failing that, it may be put close to the picture at the left-hand bottom corner. It should on no account be right out in the main area of the mount, since that is where it will stand out most conspicuously, and that is just what we do not want. On the whole, however, the back is the place both for the title and for the photographer's name. On the front the picture should be left to speak for itself, and to speak without any interruption.—R. C. B., in *Photography.*

Factors in the Blistering of Prints

As the letter from several correspondents recently have shown, the hardness or softness of the wash-water is a very material factor in the blistering of prints, particularly in the case of those which are passed through the customary sepia toning process of bleaching and darkening or toning by a sulphide bath. Nevertheless it requires to be borne in mind that, after all, this action of the wash-water is a secondary one. The wash-water plays a part in a series of physical changes which, according to circumstances, may or may not give rise to blisters; or, to put it another way, there are predisposing causes to blisters the effect of which is intensified by a wash-water which is soft. It may, therefore, be of service to examine these somewhat more closely, in order that the causes which in the first instance provide the opportunity for blisters may be recognized and, in a measure, avoided.

In each case there must be what we may call an incipient blister, or a minute defect or cavity capable of development into a blister. Such defects may be due to various causes. Rough handling, or friction between prints in the various baths, is very liable to put a local strain on the soft wet gelatin that causes it to lose perfect adhesion with the paper support. But, also, it is not easy in any case to ensure that the gelatin adheres perfectly to the paper in every part, especially when the paper is rough-surfaced. In fact, many blisters are due primarily to the facts that paper is the support, and that it has a peculiar structure. Contrary to general ideas, blisters are very often in the paper itself, and not between the gelatin and the paper at all. This can easily be proved by cutting through the blisters and examining their inner surfaces. The cause is not difficult to understand. Paper is actually a kind of felt of interlaced fibers, but it differs from ordinary felt in that its thickness is very small indeed compared with the length of the fibers, while the fibers are brought together in somewhat different fashion. In the paper-making machine the fibers settle down in layers, and while each layer is well felted together there is not nearly so much entanglement of the fibers between the separate layers. Thus, the fibers at the back of a sheet of paper are not very intimately entangled with those on the front surface, and the consequence is that even thin paper, such as that on which the "B. J." is printed, can often be split into two thinner sheets. Such splitting often occurs when a piece of paper is torn apart, while photographers with any experience of the unmounting of prints must be familiar with it.

The weakest part of a sheet of paper is therefore in the middle of its thickness, or between the back and front surfaces, and at any point where there is no direct fibrous bond between front and back an incipient blister may exist, or be produced by slightly rough usage. Any cavity, however, minute, may develop into a visible blister if favorable conditions exist, and such conditions may very easily exist at some stage of the photographic process. The conditions are simple enough to understand, and when understood they are usually quite easy to avoid; therefore it is very advisable to know them. Taking the case of any minute cavity, either in the paper or between the paper and the gelatin, if that cavity is first filled with a strong solution of almost any kind, and while thus filled the whole print is immersed in pure water, then that water immediately rushes into the cavity to dilute the solution contained therein, and at once expands that minute cavity into a large one. This phenomenon, called "osmosis" by chemists, is perhaps the almost universal cause of the swelling of blisters. The truth of the explanation can readily be demonstrated by putting a blistered print into a very strong solution, when the water will immediately rush out of the blisters into the stronger solution outside, and allow the blisters to subside. The essential thing, therefore, is always to avoid following a very strong solution by plain water, for the greater the difference between the two fluids, the greater is the chance of blisters.

If the strong solution happens to be hypo then even hard tap water may produce blisters, while pure distilled or soft water will cause blisters when tap water will not. The effect, however, does not depend solely on the difference between the two fluids, it depends to some extent on the nature of the solutions. Some salts will diffuse out of the cavity very rapidly, almost as much so as the water rushes in; then the danger is lessened On the other hand, some will only diffuse out slowly, strong hypo, for example, and then the risk is much greater. Further than this, the condition of the gelatin through which the diffusion has to take place affects this question materially. For example, no salts will diffuse through a membrane that is saturated with a ferrocyanide compound, and the partial existence of such a compound may hinder the diffusion very materially. Possibly, we do not know for certain, the use of the ferricyanide and bromide bleacher may have some slight influence on the formation of the blisters that form in sulphide toning. Another thing that must obviously affect the result is the relative softness or toughness of the gelatin. If this has been especially softened by previous baths it is clear it can offer little or no resistance to the pressure of the inrushing water, hence the formation of blisters must be favored. Such a softening solution is the sulphide bath used for toning; therefore there are two good reasons why this bath should never be stronger than necessary.

Blisters that are formed between gelatin and paper are usually fatal to the print. They can generally be identified by their softness and flabbiness, and their positions will usually be clearly shown on the dried print by uneven shrinkage of the gelatin. On the other hand, blisters in the paper may subside without leaving a trace. Such blisters usually subside evenly in a strong hypo bath, whereas the others will mostly collapse and crinkle up. If a multitude of blisters appear the best thing to do is to throw away the print, for one can hardly expect all to disappear; but if there are only one or two the case is not necessarily hopeless. The remedy is to apply a strong bath that will shrink the blister, and then follow by more dilute baths to avoid reswelling. After this, tap water can be used with greater safety. If the blisters occur in washing after fixing, we may just as well use hypo as not for the letting-down baths; but if we wish to avoid hypo then ordinary salt is a good substitute. Alum, formalin, or spirit will not, according to our experience, help much at this stage, though spirit, cautiously applied, may be used to shrink the blister just before the drying stage. It is, however, liable to leave a visible trace. Alum and formalin can only play their parts effectively if applied before the blisters appear, and cannot do much to remedy existing blisters. No pressure should be applied to a blister with the view of squeezing out the water. Pricking is sometimes advocated, and we have used it with success, employing a very fine needle; but it does not always succeed. A safer method, we think, is the gentle application of a little alcohol with a soft brush; but the safest perhaps is to put the print face-up on blotting paper and let it dry as it will. Paper blisters that have disappeared during the drying can sometimes be actually cured in the mounting process, for a soft starch or paste mountant well rubbed into the paper will often effectually seal up the cavity left inside the paper.—*B. J.*

Photographing Cut Glass

Among the various expedients for photographing cut glass effectively is one of filling the vessel with a very dilute solution of potassium permanganate, and dusting the exterior with a little finely-powdered French chalk. It might answer well where the reflections from the facets are regarded as undesirable; but like most of the suggestions which are made in this connection, it overlooks the fact that an image of cut glass without reflections loses the most striking characteristic of its subject.—*Photography.*

A Glue for Celluloid

Workers who believe in using all and every photographic scrap frequently need a glue to mend together broken celluloid articles. A very good formula, and one well tried, is the following.

Shellac	2 parts
Spirits of camphor . . .	3 parts
Strong alcohol	4 parts

Dissolve the shellac, etc., in a warm place, and keep well corked. Besides glueing celluloid, it fixes wood and most metals to it.—*Amateur Photographer.*

Semi-matt Printing Paper

An excellent semi-matt printing-out paper can be made at little cost that will give very rich prints in sepia, brown, or purple brown, as well as possessing good keeping qualities after sensitizing. In fact, the paper will keep good for two months without deteriorating for printing purposes. It may be contended that there are plenty of developing papers that have, in most instances, supplanted printing-out papers, but for quality and richness in color from a genuine sepia to a blue black, the paper to be described here has no equal.

Make up the following salting solution:

A

Fresh albumen of eight eggs.	
Distilled water	12 oz.

B

Chloride of ammonium (c. p.)	100 gr.
Sodium chloride (c. p.) . .	80 gr.
Distilled water	12 oz.

Churn mixture (A) well with a rotary egg whisk, add salt mixture (B), then churn the whole vigorously for five minutes. Allow this mixture to stand all night, then strain it through a double fold of wetted cheesecloth into a clean stoneware pitcher, and filter finally through absorbent cotton pressed lightly into the neck of a glass funnel, allowing the liquid to drip upon a strip of glass placed diagonally in a two-quart wide-mouth bottle. This procedure will prevent air bubbles being formed.

Coating the Paper

Pour the salting mixture into a clean tray, suited to the size of the sheets of paper to be coated. The paper may be almost any kind—Steinbach's drawing paper, Whatman's hot pressed, Whiting's or Japanese paper—which should be cut to size, packed together, and stored in a cool, damp place previous to coating. Float each sheet by lowering, so that the middle of the paper touches the liquid first, then gradually let each end down, so that the sheet floats upon the surface. As soon as this is done, carefully lift at one corner to see that no air bubbles are formed. If they have, they can be dispersed by dipping the forefinger into the liquid and touching the spot. Examine each sheet thus, then lower it upon the liquid; allow to remain for two minutes, then lift the sheet by one corner, clip it, and allow it to drain over a teacup, so as to get rid of all excess of liquid; now clip it with two clips and suspend it upon a stretched wire to dry. Any number of sheets may be prepared in the same way, and all kinds of paper can be salted with this solution. Paper so prepared will keep well for any length of time before sensitizing. It will be advisable to mark the *back* of each sheet, so as to be sure of the salted surface.

SENSITIZING SOLUTION

Nitrate of silver (re-crystalized)	4 oz.
Citric acid (crystals)	400 gr.
Distilled water	40 oz.

Dissolve the above in one solution, filter it through a small tuft of absorbent cotton pressed lightly into the neck of a glass funnel; pour this into a clean tray, then float the dried salted paper upon this solution for three minutes. Pay attention to any air bubbles that may form. Don't allow the paper to be excessively dry previous to sensitizing. After three minutes' floating suspend the sheet cornerwise over a funnel placed in a wide-mouth glass bottle. These drippings may be added to the stock solution. As soon as all the sheets have been sensitized and thoroughly dried, they may be rolled together or kept flat by packing them in a large printing frame, away from light and under pressure, until required for use.

Printing and Toning

The paper is used in just the same manner as any other printing-out paper, the depth of printing being only a shade beyond that required for the finished print.

The toning bath must be weaker than for P. O. P., made up with borax and gold chloride in the usual way, with double the quantity of water.

For sepia tones, which will be very rich in color, hyposulphite of soda alone being used (to test twenty on the hydrometer), complete fixing and thorough washing are necessary.

The toning can be carried out so as to secure any color required, the prints being very uniform. The surface of the paper may be rough or smooth, only the rougher the surface the more damp the paper must be to secure a perfect coating both in the salting and sensitizing. Of course, the operation of sensitizing and drying must be carried out in a room away from white light.

The salting can be done in daylight, while the sensitizing can be done by gas or electric light of not over sixteen candle power. If the sensitizing solution becomes discolored by use, a few drops of a solution of permanganate of potassium, thirty grains in one ounce of water, will clear it, when, by refiltering and strengthening, the sensitizing can be carried out again.—A. J. Jarman, in *Bull. Photog.*

Wide, Medium, and Narrow Angle Lenses: Wide-angle Perspective

Anyone who attempts to photograph a room for the first time learns at once the inconvenience of not having a wide-angle lens. Unless he dwells in palatial quarters, he is unable to get far enough away to include in the picture more than one corner of the room, using the lens commonly supplied with a camera. Unless a good deal of such work is to be done he is not justified in getting a wide-angle lens. In fact, the amateur who has a lens of medium angle, such as that likely to be on his camera already, will find, if he can afford another lens at all, it is better to get one of narrower than of wider angle.

The meaning of these expressons can soon be grasped. Let the photographer examine his own camera, measuring the distance from the lens to the plate when some fairly distant object is in focus. He can regard this as the focus of his lens, and the measurement will be near enough if made from the stop in the lens. Then, on a sheet of paper, let him draw a capital T, making the upright of the T equal to the distance of the stop in the lens from the plate or film, while the top of the T is equal to the diagonal of the picture which the camera will take. If he then draws two lines joining the extremities of the T, the angle those lines make with each other will be the angle included by the lens.

If we place the diagram so drawn on a table or floor with the upright of the T pointing toward the subject we propose to photograph, the two lines last drawn, if continued toward the subject, will show us what of it the lens will include from that position. This does not hold good in a strict sense with near objects, unless the near objects are focussed before measuring from the stop to the plate; but it is near enough to give a good idea of the angle.

If the upright of the T (which corresponds to the "focus" of the lens) is comparatively short, it is evident that the angle included is a wider one than if it is long; hence, wide-angle lenses are often termed short-focus lenses. Provided the dimensions of the plate or film remain the same, the shorter the focus the wider the angle. The scale of objects in the photograph depends on the focus of the lens: for so long as the position of the camera with reference to the subject is unaltered, the linear dimension of any part of the image is proportional to the focus of the lens. If we have a sitter, for example, whose figure on the ground-glass is just 2 in. high with a lens of 5 in. focus, it will be 4 in. high if we substitute a lens of 10 in. focus, and 1 in. high with a lens of 2½ in. focus; provided, of course, the relative positions of camera and sitter remain unaltered.

So that the shorter the focus the smaller will be the scale of the image. This follows from the fact that the shorter the focus the wider the angle included; since, if we include more of the subject in our picture, it must be shown on a smaller scale to get in the additional subject without increasing the size of the negative.

When we confront a subject to photograph it, therefore, we find that to get in all of it we must either use a lens of sufficiently wide angle from the standpoint selected, or we must go further away until the angle included by the subject is narrow enough for the lens we have in use. In most of the subjects with which the amateur occupies himself the latter course is open to him; but occasionally he finds that he cannot get far enough from the subject to include in his picture all that he would like. There is then nothing for it but to substitute for the existing lens on the camera one of wider angle.

At one time an extra lens—a wide-angle one—was the ambition of every amateur; but feeling has rather gone in the other direction recently. The lenses generally fitted are quite wide-angle enough for most of the work required. In fact, if anything, they err by including too wide an angle. For the effect of very wide-angle pictures is often not agreeable. Everyone has come across examples of what is called "wide-angle perspective," in which near objects seem enormously magnified, while those further off seem to be carried to a great distance away and dwarfed.

So common has this been in the past, that it has even been called "photographic perspective," and spoken of as if it were a fault inherent in the camera picture, instead of being what it is, an example of the misuse of the instrument. The lenses generally supplied ready fitted to cameras are sufficiently short in focus to give this effect when used with subjects likely to emphasize it: but avowedly "wide-angle" lenses are even worse. So that there has been a tendency of late in favor of lenses of longer focus in proportion to the size of picture. Hence the popularity of what are called "convertible" lenses; in which a part of the lens can be unscrewed, leaving the rest in position, when it acts as a lens of longer focus than the entire instrument.

The terms "long focus," "wide-angle," etc.. are only approximate and general. There is no hard and fast boundary, passing which classes a lens as wide-angle or medium angle, long focus or short focus; but, nevertheless, the terms are pretty generally understood.

Taking the case of a quarter-plate as typical, we have a picture 4¼ x 3¼ in. The diagonal of such a plate measures just over 5¼ in. The lenses commonly supplied on quarter-plate cameras range from 4 in. to 5 in. in focus, 4½ in. being perhaps the commonest, although in the more expensive patterns a 5 in. lens is more often found. Anyone setting out this, in the way described above, will find that the angle which is included by a 5 in. lens when used on a quarter plate is about 55°.

One wide-angle lens advertised for quarter-plate work in a price list before me is of 3¼ in. focus, so that it includes an angle of 80°. Another quarter-plate lens is said to include an angle of 90°. Its focus is not mentioned, but it is easy to see by constructing a diagram that it must be about 2⅝ in. A lens of 7 in. focus used on such a plate includes about 40°.

We shall be safe if we regard the "average" angle lens as having a focus not more than equal to the diagonal of the picture, generally a little less. If it is less than three-quarters of the diagonal it is very decidedly a wide-angle lens. If its focus is half as much again as the diagonal, or more, it is a long focus lens: twice the diagonal is not at all uncommon, and for certain purposes some workers even prefer three times the diagonal With anything more than one and a half times the diagonal we need not fear any of the ill-effects of "wide-angle perspective."—R. C. B., in *Photography.*

Printing upon Silk with the Salts of Silver and Iron

The making of prints upon silk or linen and upon several kinds of canvas usually involves the previous preparation of some salting compound and after sensitizing with a solution of nitrate of silver. The sensitizing of fabrics with platinum is an exception.

The process about to be described differs in so far that the material to be sensitized requires no previous salting or the employment of gelatin, gum or starch; the preparation is ready for use just as soon as it has cooled down. The application to silk can be made with a good camel's-hair brush or a piece of canton flannel tied over a two-inch-wide strip of glass, with the fluffy side outward, or, if neither of these are at hand, a tuft of absorbent cotton can be used for the even distribution of the sensitizing material. One important condition is that, when the sensitizing of the silk has taken place, the drying should be hastened; rapid drying will cause the image to become more clear and brilliant. The sensitizing mixture is prepared as follows. The mixing must be made in a wide-mouthed, amber-colored glass bottle away from actinic light.

No. 1

Ammonio-citrate of iron (Green)	1 oz.
Distilled water	8 oz.

No. 2

Citric acid (crystals)	1 oz.
Hot distilled water	4 oz.

No. 3

Nitrate of silver	1 oz.
Hot distilled water	4 oz.

Add No. 2 to No. 1, shake well, then add No. 3 and shake the bottle vigorously. As soon as the mixture is cold it will be ready for use.

To sensitize the silk, lay it down upon a clean sheet of celluloid or a clean sheet of glass and take care that no metal comes into contact with the liquid; then brush the surface of the silk over carefully with a camel's-hair brush set in india rubber, or the canton flannel, as described. As soon as the surface is evenly coated, clip the top corners with a shellac varnished wooden photographic clip and suspend in a dry, warm room away from white light until quite dry. A number of pieces may be sensitized and, when dry, placed in a printing frame with a sheet of clean glass and kept under pressure until required for use.

Printing. Place the negative in an ordinary printing frame. If the negative is a film, simply place a piece of clean glass in the recess of the frame, and place the film upon this. If it is desired to vignette the portrait, the arrangement must be made up and tested upon a piece of P. O. P. beforehand; in any case lay the prepared face of the silk down upon the negative, and expose in a good light until the image appears well in a good brown color.

As soon as the printing is complete the pieces must be well washed in clean cold water half a dozen times, or more, to extract all traces of the sensitizer. It may then be fixed in a weak solution of hyposulphite of soda, measuring 18 on the hydrometer. Fixing is usually complete in about ten minutes. The silk must then be well washed in cold water half a dozen times, then in hot water; then rinsed well, dried and ironed out with an ordinary flatiron; if ironed upon both sides the image will be found to come up well, taking care to iron the face upon which the print has been made last. The print can be washed several times in warm water previous to ironing without fear of injury.

Silk of various colors can be used and arranged for framing, or made into pin cushions, or bound with a suitable silk cord, and suspended upon the wall, or made into cushions. Silk stool tops can also be made in this way, and form not only handsome presents and souvenirs, but produce good articles for sale. Any photographer could increase his income by undertaking such work as this for many of his customers, or without receiving an order in the first instance, produce a number of such prints on speculation. In eight cases out of ten these prints would be purchased, when other orders would be sure to follow. Once recommended by these customers to their friends, other orders would be sure to follow. It would prove a good and novel means of advertising a business and bringing new customers for other photographic work. All such novelties are worth the attention of photographers because they advertise their business and bring the name of the photographer before a class of people that probably never heard his name before, or had hitherto seen the class of work that such a house produces. Novelties of this kind will oftentimes attract and bring to the notice of a considerable number of the public the kind of work they have been looking for, when the introduction of a trade card used by everyone would not possess any such attraction. From this standpoint alone this class of work will prove to be a good means of advertising.

It must be mentioned here that there are two kinds of ammonio-citrate of iron, the brown and the green. If the brown salt is used and the keeping qualities of the material are affected, the green variety possesses better keeping qualities.

The use of ammonio-citrate of iron as a photographic compound was first discovered by Sir John Herschel in 1845, and there have been very many photographic preparations made with it, particularly the blue-print paper which has become a daily article of trade.

The production of photographic prints in various forms has also been made with the compounds of nitrate of silver and the ammonio-citrate and ammonio-tartarate of iron. In all these preparations the resultant image is of a rich sepia or brown.

Although silk only has been mentioned in this article, linen can also be used. If linen is used the article or piece of fabric should be well washed with soap and water after the fixing and washing operations, previous to ironing. If the silk is submitted to the same operation no harm will accrue; the main point to be attended to in the use of the salts of silver and iron is to be sure that the fixing operation and thorough washing are carried out as perfectly as possible. If this is attended to there need be no fear of permanency in any of the prints so made.

Self-toning Paper

THE present great demand for self-toning paper prompts us to offer a few hints on its successful working. Although its keeping qualities are good, the paper should be used as quickly as possible, and if there is a slight discoloration this will be cleared away in the fixing.

Failures to obtain good colors or tones are tabulated below, the first one being by far the most prolific cause of poor tones:

1. "Drowning" the gold that is incorporated in the emulsion by using too great a bulk of solution for the number of prints. The rule to observe is to use only sufficient fixing-solution to just comfortably cover the prints.
2. Using an old fixing-bath that has done duty for plates, etc. The hypo-solution must be freshly made, and no other ingredient added.
3. Too weak a fixing-bath. A good strength is 5 to 6 ounces of hypo to a pint of water. This gives fine brown colors on our "Autona" paper, with no trace of double tones.
4. Prolonged washing after fixing may spoil the prints. One hour in running water is ample.

For amateurs, and for dealers who specialize in "finishing" amateurs' work, the self-toning process gives beautiful prints, and provided the fixing is properly done, the results can be said to be permanent.

The time of fixing with a bath of 5 ounces to the pint should be ten minutes at about 60° F. Longer immersion in the fixing-bath may reduce the prints considerably. Prints that have been over-printed can be fixed in a stronger solution, or for a longer time in a normal solution, thus taking advantage of the slight reducing action.

Some amateurs place their self-toning prints in a combined toning and fixing solution as used for P. O. P., and to these we must point out the necessity, for permanence sake, of afterward fixing them in a bath of plain hypo (2 ounces to the pint of water) for ten minutes.—Rajar, *Trade Notes.*

Washing Prints—Some Suggestions

It is an undoubted fact that perfect fixing is far more important than prolonged washing, but the object of this month's note is to offer some suggestions as to methods of getting rid of the hypo from bromide or gaslight prints. Many photographers have lately been compelled to use water-meters and now find it necessary to economize.

One method, particularly suited to our friends who print postcards in strips of six-on, is to fix a board sloping from the tap to the sink and to use this for washing and squeegeeing upon. The strips are taken from the fixing-bath one by one and placed face up on the board, so that the water from the tap runs on the top end of the strip, flows down to the bottom end, and thence to the waste outlet. The strips are placed one on another until a thick pile is obtained. This pile is then turned over so that the strips are now face down on the board in a solid block, and a flat rubber squeegee is drawn quickly down the back of the first strip on the pile. This strip is then thrown into a dish or tank of water, and the operation repeated to every strip on the pile. If they are to be sulphide-toned it is necessary to repeat this operation two or three times more, and there is little waste of water if the worker is quick in the use of the squeegee. We regard the intelligent use of a flat rubber squeegee as a saver of time and water.

When large wooden washing tanks are used, the water should enter at the top and run out at the bottom, the hypo, being heavier than water, sinks to the bottom of the tank and is carried off. The outlet pipe (which should be at the opposite end of the inlet) should be fitted with a tap for regulation with the inflow, and it should be closed while the tank is being filled. Of course it is very necessary to turn the prints over occasionally. Another method is to place the prints in several complete changes of water. This method will economize water, and the success of it depends upon thorough draining of each print at every change.—Rajar, *Trade Notes.*

Bad Bromides

Nearly all photographers make bromide prints; a minority make good ones; more make passable ones; and the remainder make poor ones. The worst of it is that those who make the poor ones do not realize how poor they are. One of the greatest factors in the production of bad bromides is the idea that a thin negative is necessary, a thing which has become such an obsession with some workers that they go on making thin negatives and then seek for "contrasty" paper to print them on. This is quite an unsound way of working, for any paper which produces a print in a different scale of tones from the negative is not so likely to give an accurate rendering of the tones of the original subject. Some sort of a print may be made from almost any kind of negative on bromide paper, but a good plucky but not over-dense negative which will give a good platinum or carbon print will give the best class of print in bromide. Two points necessary to be observed whatever class of negative is being used, are correct exposure and full development. These ensure a bright print of good color which will give a satisfactory sepia with either sulphide or hypo-alum toning. The usual practice of bromide printers in portrait studios is to give a long exposure and then to develop for a very short time, often hardly relinquishing their hold of the paper while it is in the solution. Thence it is transferred without rinsing to the fixing-bath. Such prints are usually lacking in brilliancy, instead of being a pure black they usually have a rusty tint, and if toned yield the "ginger" hue which disgraces so many show cases. To ensure correct exposure it is only necessary to make a few test strip exposures ranging, say, from two to thirty-two seconds, from three or four typical negatives and to develop these fully out, or at all events for a fixed time, say two or three minutes. It will then be easy to discover from the strips the correct exposure for each class and to note it on these typical negatives, also noting the exact distance between the light and the printing frame. There are many self-satisfied printers who would be quite surprised in the improvement in the quality of their output if they would but work on this system.

Except for very thin negatives it is best to omit bromide of potassium from the amidol developer, which is, in our opinion, the best one for bromide work. M. Q. has the advantage of durability and it also avoids stained fingers, but it does not yield the pure blacks and grays given by amidol, and prints developed with it do not tone to such good colors as amidol-developed ones do. The greater lasting power of metol-hydroquinone is in itself a danger, for there is always a risk of using it with occasional strengthening long after it has absorbed an undesirable quantity of bromide from the prints previously made in it. This is indicated by the hardness and greenish color of the prints. Amidol becomes exhausted more quickly and at this stage gives poor rusty-colored prints. Different samples vary considerably in their developing power, so that it is impossible to say how many prints a given weight of the salt should develop properly. It is false economy to overwork the developer especially at the present price of bromide paper. Except when it is necessary to stop development instantaneously, prints should always be rinsed before fixing. Amateurs and those who only develop a few prints occasionally may perhaps disregard this precaution, but when a large number of prints is made daily and the bath not renewed very frequently there comes a time when the character of the fixer is changed, and muddy-looking prints result. There is no gray fog such as is caused by exposure to light, but the whites have a dingy tint which is best described by comparing them with the white of an egg which has not quite reached the election stage.

Although pyro-soda has been occasionally mentioned as available for the development of bromides, there is one point which has not yet been fully appreciated, and that is its power of producing vigorous prints on ordinary paper from flat, thin negatives. An ordinary formula may be used, but should contain at least 40 grains of sulphite per ounce of mixed solution. A convenient way of adding the extra sulphite is by diluting the concentrated solutions with a 5 per cent. solution of sulphite of soda instead of using plain water. Toning troubles are few with properly made prints, but there is one which must be specially guarded against—namely, imperfect washing before bleaching. A slight trace will cause a general reduction of the image, while uneven washing, leaving a considerable quantity of hypo in places where prints have hung together, results in a patchy appearance, some parts almost disappearing, while others tone to a good color. Weak sulphide solution is another common cause of bad tones. It has been stated that, given sufficient time to act, a weak solution will answer as well as a stronger one, but that has not been our experience. We have found that even with quite weak prints a good brown tone, not orange, can be obtained with a solution made as strong as the paper will stand without blistering. Of course, there is no accession of strength, but the color is good: on the other hand, a weak solution gives a poor color to even a vigorous print. With regard to the bleaching, we have found the best tones to be obtained by a bleacher which worked rather slowly, taking, say, five minutes to bleach a fairly strong print.—*B. J.*

Dusting Plates

It has been advised by some writers that one should never dust plates, and with certain makes this is excellent advice. With the majority, however, it is advisable to dust them before placing in the dark-slides, but it is difficult to believe those who say that dusting the plates puts dust on and attribute this remarkable phenomenon to electrical action set up by the friction of the brush on the film! Taking a clean camel-hair brush and a spoilt plate, the writer held the plate so that every speck of dust could be seen. He then proceeded to brush off the dust gently, and found that two or three tiny specks still remained, but continuous brisk action with the brush did not result in any attraction of further dust to the plate. This superstition seems to have arisen from neglect of precautionary details. A brush laid on the bench will pick up dust and deposit it wherever it is used. It should be hung up by a length of elastic so that it can be pulled down for use, but will spring up and hang clear of everything. It should also be flicked with the fingers before use, so that any dust adhering to it will be removed, and another point apparently obvious, but often forgotten, is that the plates should not be dusted over the dark-slides. The slides themselves should receive frequent dusting both inside and out if freedom from pinholes is desired. Another unsuspected cause of dust on plates is that which has collected on the shelves and ceiling of the dark-room. The slam with which one makes sure of shutting the door prior to loading up dislodges some of this, which comes slithering down, invisibly in the dim light, but persistently, and settles on the plates as fast as one dusts them.—*B. J.*

Notes on Gaslight Papers

Washing is unnecessary between developing and fixing.

Gaslight papers may be manipulated in very subdued daylight.

Ordinary thick grade gaslight papers can be cut up and used for postcards.

Finer black tones are obtainable on gaslight paper than on bromide paper.

An expert "gaslight" printer should turn out two dozen perfect prints per hour.

Fresh developer gives richer tones than developer that has been used several times.

Thin smooth-surface gaslight papers can be used for making good contact negatives from positives.

The sulphide toning bath gives equally good results with gaslight prints that it does with bromides.

Small prints can be developed most easily by means of a camel-hair mop and normal developer.

Impure whites are due to working in too strong a light or insufficient bromide in the developer.

An olive-green tone is obtained by over-exposing, and adding extra bromide of potash to the developer.

Discoloration round the edges of print when developed may arise from hypo contamination in the developer.

A purplish-blue tone is obtained on gaslight prints by prolonged toning in a sulphocyanide and gold toning bath.

Long exposures and development with dilute developers give warm colors; short exposures and development with strong developers give blue-black results.

If colors obtained by development are too weak and flat, a less exposure and longer development are wanted. If too strong, expose more and develop less.

Underexposed prints which have been forced in development and slightly fogged in consequence may be somewhat improved by leaving in acid fixing-bath for thirty to sixty minutes.

If some part of the high-lights becomes yellow while others remain white, it is a sign of insufficient fixing. This frequently comes about from trying to fix a large number of prints at one time.

An exposure of one to three minutes at a distance of six inches from an ordinary fish-tail gas burner is necessary with most gaslight papers. If daylight is used, two to five seconds is usually sufficient.

The approximate comparative values of artificial lights for gaslight printing are as follows: Incandescent gaslight, 1; incandescent electric light 3; ordinary fish-tail gas burner 4; Duplex oil lamp, 6.

"Gaslight" postcards are developed in exactly the same way as gaslight papers, but are more liable to abrasion when washing. Soaking in repeated changes is therefore better than washing in running water.

Yellow or brown stains are most commonly caused by allowing the air to get at the print while wet with developer; incomplete fixing or insufficient washing after fixing may also cause stains to appear afterward.

A rich warm black tone can be given gaslight prints by bleaching in mercuric chloride, 120 grains; hydrochloric acid, 2 drams; water, 6 ounces; well washing and redeveloping in a combined toning and fixing-bath.

Preparing Prints for Coloring

The necessity for treatment of the surface of a photograph so that it will readily take the coloring media, whether water, oil, or pastel, is not always appreciated by the artist, who often expends a vast amount of unnecessary labor by trying to work upon an unsuitable surface. The artist who has been accustomed to work upon the virgin surface of Whatman or Creswick paper or on a well primed canvas finds himself at a loss when confronted with a smooth gelatin surface, which swells up at every touch and yet seems to offer no "hold" to the color. He accordingly has to acquire a totally different touch. Prints made by different processes need surface treatment almost as different as the processes themselves, a carbon print usually having a repellant surface, while a platinotype has one of too absorbent a nature. Hence it will be seen that the preparations to receive the same kind of coloring must differ in their essentials.

Gelatin Prints

Most of the work is now done upon gelatin-coated papers, either P. O. P. or bromide, and these require the least preparation of any. If it be possible to have the print specially made it is desirable to harden the gelatin slightly by immersion in a weak formalin solution. Alum should not be used, as it will react upon many of the colors. The formalin solution should be weak, or the surface will be horny and repellent of the color. Prints for coloring are best when mounted with starch paste; dry-mounting has a tendency to harden the surface in places and to cause unevenness when applying washes. This is probably caused by too high a temperature, as it seems to occur most when using thick papers. If when examining the surface by obliquely reflected light any patches, either rougher or more polished than the remainder of the surface, are visible, the whole of the surface should be sponged with clean water and allowed to dry. Sometimes such patches are due to a trace of shellac from the tissue, and are not removable by water; they will, however, yield to an application of methylated spirit, a clean tuft of cotton wool being used each time, both for applying and removing the spirit. Nearly all prints having a gelatin surface are the better for a rub with benzole. This removes all reasy patches caused by handling, such patches not being uncommon once the print has been in the customer's hands.

For Colors to Take

Although not absolutely necessary, it is desirable to give the surface of the print a coating which will make the color take kindly to the surface. For this I have found nothing better than a very dilute solution of Newman's sizing preparation. This seems to give a tooth to the surface and removes the tendency for the colors to stand in pools when applying a wash. A little may also be mixed with the colors, giving them more consistency and a richer effect when dry. A more general method is to use purified oxgall for the purpose; it is applied in the same way. It is very necessary to use the colorless variety sold in bottles, as the dark sort which is put up in china pots will degrade delicate flesh tints. A few drops should be mixed with a little water, and this should be washed over the entire print, using a rather large camel-hair brush. If the surface is inclined to be greasy the brush must be worked about until the moisture lies evenly. When dry the print is ready to color. Nearly all prints on gelatin, albumen or collodion can be worked upon by using one of these two mediums.

Carbon Prints

Carbon prints when made by the double transfer process usually have a decidedly waxy surface, and this must be removed by carefully rubbing with a piece of clean flannelette well moistened with benzole. If this is not to hand, good motor spirit will answer very well, but care must be taken to get pure petrol and not "mixture." This cleaning process also removes any particles of dust which have settled on the gelatin image when in a semi-dry condition. Carbon prints sometimes give trouble in coloring, because they are more or less glossy in the shadows and matt in the high-lights, and I have sometimes found it advantageous to flow the surface over with a thin gelatin solution rendered insoluble with chrome alum. This gives a homogeneous surface which is very pleasant to work upon. It is best to do this before the print is trimmed and mounted. I have even used this on a "full gloss" collodionized carbon, which was thus rendered as easy to work upon as if it were an ordinary albumen print.

Platinum Prints

Platinotypes do not suffer from greasiness; on the contrary, they are usually too absorbent, and if a touch or wash is a little too deep in color it is impossible to modify it. For this reason I have always found it desirable to dip them into a weak gelatin solution, which fills up the pores of the paper and makes the surface as pleasant to work on as ordinary drawing paper. I once treated a number of 12 x 10 platinotypes in this way and handed them to an artist who had no experience of photographic finishing. They represented single figures and groups on a perfectly white background, and had to have appropriate scenery sketched in on each. This the artist did as easily as upon his accustomed Whatman paper. Those who have tried to work extensively upon platinum papers will realize what this means.

For C.C. and Gelatin Prints

Collodion papers are sometimes very horny and repellent of water. This may be overcome by washing the surface with a solution of soap bark made thus: Fluid extract of quillaia, 1 dram; water, 1 ounce; alcohol, 1 ounce. The alcohol has the effect of softening the surface of the collodion, while the quillaia acts in the same way as oxgall.

Some authorities recommend a mechanically produced "tooth" for coloring upon gelatin-surfaced prints. This is obtained by rubbing on very finely powdered pumice stone or powdered cuttlefish. These must be sifted through very fine silk or muslin, as particles of any appreciable size will produce indelible scratches. The best way of doing this is to tie the powder into a sort of pad like a powder-puff and to dab this on the print. A little powder will sift through, and this is rubbed into the surface with cotton-wool. When the surface is dulled enough any remaining powder must be removed with a pad of clean cotton-wool. This method is usually employed for pastels or dry powder colors, which are afterward fixed by steaming the print; but it will also answer with water-colors.

For Coloring in Oil

When oil colors are used upon gelatin prints no special preparation is necessary excepting a rub with benzole to remove any trace of grease, which would prevent the oil from drying. If there are any cracks or if the surface has been worked upon with the knife a thin priming of starch with or without the admixture of a little gum water may be given with advantage, as if there is the slightest break in the gelatin coating the oil will penetrate the paper and spread in the thickness until a very unsightly patch appears. It may seem absurd to suggest so simple a precaution, but it is always as well to make some protection for the mount or margin of a photograph before commencing to color it. It can then be handled freely without marking the mount. An ordinary large manilla envelope is as good as anything. The front has an opening cut in it the size of the print, and the print is slipped in and the flap secured with a bit of stamp edging. This allows the print to be removed without tearing the envelope, which will serve for several prints.

Aniline dyes or "photo tints" are usually accompanied by a special medium, which is to be washed over the print before coloring. In the absence of this a weak gelatin solution or even gum water may be used, and in many cases the natural surface will take the color readily.—*B. J.*

Photographing Materials and Processes

Photographic plate; Effect of a "flash" exposure ("Vorbelichtung") on the rendering of weak light-impressions on the ——. J. M. Eder. Z. wiss. Phot., 1917, 16, 219–224.

A CRITICISM of a paper under the same title by J. Rheden (Z. wiss. Phot., 1916, 16, Nos. 2 and 3). Reference is made to the previous work in the same field of Eder (1882 and 1884), Burton (1882), Debenham (1882), and especially of Schwarzschild (1900), in which all Rheden's results had been already obtained. Although it appears possible to obtain an apparent increase of sensitiveness by a flash exposure (before, during, or after the main exposure) in, for example, the taking of star negatives, the method is not recommended because of the difficulty of determining the exact exposure and the danger of spoiling the quality of the negative. The similarity between the effect of a flash exposure and the forcing of development up to the beginning of "chemical fog" is also discussed.

p-Aminocarvacrol, a new [photographic] developer. H. A. Lubs. Communication from the U. S. Bureau of Chemistry. Brit. J. Phot., 1919, 56, 534–535.

CARVACROL may be prepared according to McKee's process (U. S. Pat. 1,265,800; this J., 1918, 531 A) by sulphonation of cymene and alkaline fusion of the sulphonic acid. On the laboratory scale a better yield is obtained by diazotizing aminocymene, dropping the cold diazo solution into dilute sulphuric acid, and simultaneously steam distilling. *p*-Nitrosocarvacrol is obtained by a slight modification of Klages' method, sodium nitrite in 50 per cent. alcohol being added to an alcoholic solution of carvacrol saturated with hydrochloric acid. The crude nitrosocarvacrol is dissolved in about ten times its weight of 10 per cent. ammonia, and a rapid stream of hydrogen sulphide passed into the filtered solution; *p*-aminocarvacrol separates as almost colorless leaves. *p*-Aminocarvacrol resembles metol and *p*-aminophenol in developing properties, and gives a solution which keeps better than the latter. *p*-Aminothymol did not appear to be so satisfactory a developing agent as the carvacrol compound. Thymoquinol was also prepared, by sulphonating carvacrol and oxidizing the sulphonic acid by means of potassium bichromate, but the yields were poor and the substance had no advantage over quinol as a developer.

Photographic phenomenon; New ——. D. N. McArthur and A. W. Stewart. Chem. Soc. Trans., 1919, 115, 973–974.

A PHOTOGRAPHIC negative was placed on the bottom of a light-tight box, and over it was placed, film upward, a sensitive plate separated from the negative by microscope slips. After keeping the box for some hours in the neighborhood of a source of heat—Bunsen burner, batswing flame, or electric kettle—the sensitive plate on development gave a positive image of the negative. A similar effect was produced whether the negative or the sensitive plate was nearer to the source of heat. Different heat-sources vary in rapidity of action; a Méker burner is very slow, a calcium flame is slow, a sodium or lithium flame is faster; an electric heater operated on its lower resistance gives very good results. The box containing the plates may be of either wood or cardboard. The rays producing the effect on the sensitive plate appear to be similar to light rays, being capable of both diffraction and refraction; glass is transparent to them; inkstains, seccotine, and metals show different degrees of opacity.

ol. 57. No. 2 February 1920 20 Cent

The Photographic Journal of America

FEB 9 1920

Published Monthly
With Illustrations

Efficiency in the Printing Room

can never be obtained with make-shift or antiquated equipment. A reliable, scientifically correct, modern printing machine is essential in the production of work of highest quality.

The Ansco 11 x 14 Professional Printing Machine is designed for general use. It is easy to install, economical to maintain and uniformly dependable as to light.

PRICES and full description of this Printer and other Ansco professional apparatus for photographic studios will be mailed on request.

ANSCO COMPANY

BINGHAMTON, N. Y.

New York	San Francisco	Chicago	Toronto
129-131 West 22nd St.	171-173 Second St.	308 N. Michigan Blvd.	347 Adelaide St., W.

THE PHOTOGRAPHIC JOURNAL *of* AMERICA

REGISTERED IN THE UNITED STATES PATENT OFFICE

NEW SERIES: WILSON'S PHOTOGRAPHIC MAGAZINE

AN ILLUSTRATED MONTHLY DEVOTED TO THE SCIENCE AND ART OF PHOTOGRAPHY

THE OLDEST PHOTOGRAPHIC MAGAZINE IN AMERICA
Founded 1864

Incorporating:
The Philadelphia Photographer The Photographic World

THOMAS COKE WATKINS, Editor

CONTENTS FOR FEBRUARY, 1920

Get It in the Lighting 49
On the Arrangement of Groups . . . . . Sidney Allan 52
Improvements in Optical and Enlarging Lanterns . . . . Ankatell Henderson 57
Making Cold-process Stripping Paper and Plates for Developing or Printing-out by Hand or Machine. Part V. . . . . . Alfred J. Jarman 60
Editor's Table—The Value of the Negative 64
The Studio—Practical Papers on Studio Work and Methods 66
Views and Reviews 68
The Workroom 74

YEARLY SUBSCRIPTION, in advance, postage paid, United States, Mexico, Cuba, Philippines and Porto Rico, $2.00; Canada, $2.35. Countries in the Postal Union, $2.75. Single copies, 20 cents.

REMITTANCES may be made at our risk by money order, check, draft, or registered letter.

SUBSCRIPTIONS begin with current issue.

Published by EDWARD L. WILSON COMPANY, INC.,
THOS. C. WATKINS, President. 701 Arch Street, Philadelphia, Pa.
EXECUTIVE and EDITORIAL OFFICES, CAMERA BUILDING, 122 EAST 25th ST., NEW YORK CITY
HOUGHTON'S, Ltd., London, Eng., Agents for Great Britain
American News Co., Distributors for U. S. Kodak Australasia Ltd., Sydney, Agents for Australia
RICHARD HILL, Devonport, Auckland, Agent for New Zealand

Entered at Philadelphia Post-office as Second-class Matter

This is one of a series of sketches on Leading American Photographers.

American Photographers

WM. H. TOWLES:—The Capitol photographer from the Capitol City, Bill Towles of Washington, D. C., hardly needs an introduction. You have no doubt met him before, since he has for years been prominent in the photographic press and on the convention platform.

The honors that have come to Mr. Towles bespeak the unusual merit of his work. To date he has won the modest sum of fifty-eight cups, trophies and prizes both in this country and abroad. Besides, he has held office as President of the Middle Atlantic States Association, Vice-President and President of the Photographers Association of America.

Like the great majority of photographers who have achieved unusual prominence in photographic circles, Bill Towles finds that soft-focus photography is not a passing fancy nor mere hobby, but rather a means of securing superior results that are both more artistic from the photographic standpoint and more remunerative from the financial.

For this reason he employs the Wollensak Verito, 18" focus, for practically all of his work, both in his studio and at convention demonstrations. The Verito, he finds, is a means of artistic expression, for making pictures as the eye sees, without wiry, distracting sharpness. Variable diffusion may be obtained and retouching reduced as much as 60% by the use of this lens.

The new Wollensak catalogue describes this and other popular Wollensak Lenses, and likewise reproduces some of the work of prominent American photographers.

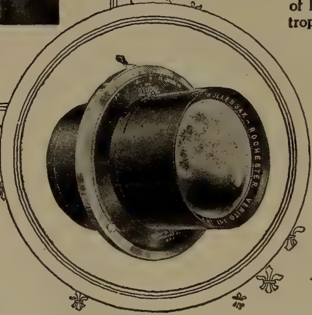
Send a card for a copy.

BY INVITATION MEMBER OF

LEADERS OF THE WORLD ASSOCIATION

NEW YORK, U.S.A.

WOLLENSAK OPTICAL CO.
ROCHESTER, NEW YORK.



AMERICAN MADE REXOLON **DEVELOPING AGENT**

Rexolon is a new universal developing agent. Rexolon offers unusual, distinctive and important advantages over all other developing agents.

1. Rexolon is chemically pure and lasting.
2. Rexolon is distinctive for the non-oxidizing qualities. It will stand in an open solution twice as long as German metol
3. Rexolon is non-poisonous to the skin, a characteristic which will appeal to all subject to metol poisoning.
4. Rexolon is a soft developer, greater contrast can be obtained by the addition of bromide, which within certain limits does not affect the tone.
5. Rexolon will produce good blacks and whites even if the negatives are under or over exposed.

Rexolon is being rapidly stocked by all photo dealers. It will pay you to give + a trial.

Put up in one, four and eight ounce bottles, also in one pound bottles.

One ounce bottle........................$1.35

CHICAGO = Burke & James Inc = NEW YORK

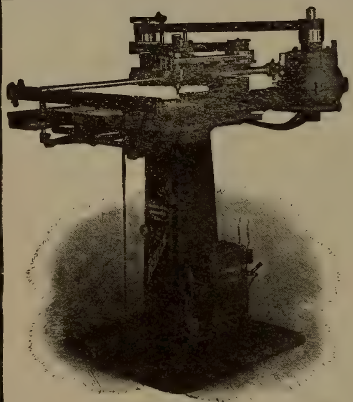


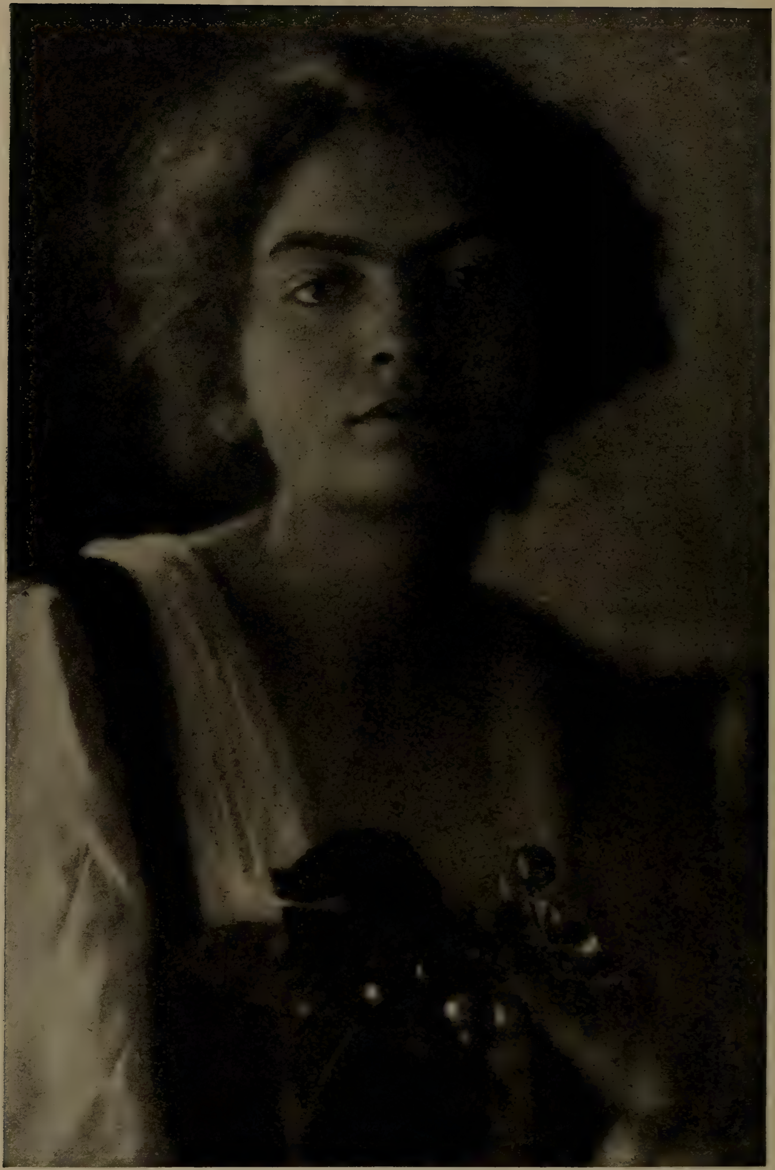
PLATE FINISHING

machines for the photo-engraver. Carefully and expertly constructed to give pleasing continuous service and the most practical advantages. Every operation provided for.

WRITE FOR PRINTED MATTER

JOHN ROYLE & SONS, PATERSON, N. J.
U. S. A.

Routers, Lining-Bevelers, Saws, Trimmers, Router Cutters, Etc.



BY CHARLES F. TOWNSEND
DES MOINES, IOWA

The
PHOTOGRAPHIC
· JOURNAL ·
· of AMERICA ·

VOLUME LVII FEBRUARY, 1920 NUMBER 2

·FOR·THE·PROFESSIONAL·PHOTOGRAPHER·THE·AUTHORITY·
PJ A
FOUNDED 1864

Smithsonian Institution
FEB 9 1920
National Museum

GET IT IN THE LIGHTING

PERHAPS there is no more important factor in the obtaining of successful results by means of photography than the possession of a thorough knowledge of the most suitable form of lighting to employ in the particular class of subject being dealt with.

It does not matter what particular branch of photography is being pursued, *lighting* is of the utmost importance, and any negligence in regard to it is certain to be reflected in the quality of the work turned out.

In portraiture, for instance, anyone who has never experienced the difficulty can form no idea of the amount of labor and thought that is incurred in the fitting up of a studio before the best effects in lighting are obtainable, and if this be necessary for the production of not only portraiture where specially fitted-up studios are concerned, but what is of equal importance, lifelike results, how much more difficult is to obtain anything like equal results in what is termed "home portraiture," a branch of photography now largely practised by thousands of amateur workers, who derive a large amount of pleasure therefrom.

In studying any face it is intended to photograph, the first aim should be to ascertain what light best suits it, and it only requires but a little consideration by anyone desirous of practising portraiture to understand that the light most suitable for one face would not by any means be equally so for another.

Therefore it follows that the professional, working in a specially fitted up studio, has at command, by means of his top and side lights, each of which is furnished with a well-devised system of screening, a power which enables him to execute portraiture in a manner superior to that which anyone working without these adjuncts and facilities need never expect to attain; and if we examine still further into the question of what is required in lighting a face to its best advantage, we will find that not only must consideration be bestowed upon the amount of direct and diffused light employed, but some thought must be given to the proper direction from which both the direct main and also the diffused lights are permitted to fall on the face and figure of the sitter.

Portrait painters, as a rule, work with a side light falling at an angle of 45 degrees, because this is found to suit the majority of faces; and this has been followed in a great measure by professionals in the construction of their studios.

In executing portraiture outside a specially fitted-up studio, say, in such a situation as a large-sized room having an ordinary window, much may be done to assist and improve the lighting of the face by means of a few well-arranged screens and reflectors.

When work of this kind is attempted in an ordinary room without any such provision being made, it generally ends in failure, by reason of the lighting showing too powerful contrasts, and this is painfully evident by the shadow side of the face coming out almost black, while the side next the light is far too hard—results brought about by a want of diffused light, to obviate which not only must there be provision made to throw reflected light upon the shadow side of the face, but, what is of much greater importance, the light that is permitted to reach the side of the face next the window must be filtered or diffused by means of thin transparent muslin screens.

In carrying out an arrangement of this kind, it does not necessarily follow that the entire surface of the window should have blinds fitted to it, for this would tend to cut off an amount of useful light that can ill be spared when working under such cramped conditions of lighting. All that is required is to provide some simple screen of muslin of just sufficient dimensions as will be capable of diffusing all the main light that otherwise would reach the face. A screen of muslin, made by stretching this material on a light frame three feet square, so that the frame can be interposed between the face and the window at a point just outside the range of the lens, will be found to work admirably.

Anyone desirous of attempting portraiture in ordinary sitting-rooms would do well to try the following experiments, from which he will be able at once to judge of the immense importance that is attached to the proper lighting of the face. At a distance of, say, four feet from any ordinary window, let a sitter be placed on as low a chair as possible, and let the body be posed so as to have the chest and front part of the figure almost facing the window, but not quite under the full light of same; then, without moving the chest or figure, let the face be turned away from the window until a somewhat side light only falls upon it. If the operator now steps back and views the effect of such a disposition of lighting, he will at once see that it is quite unsuitable, for the side next the window is much too brightly lighted, while the off-side of the face is enveloped in deep shadow in which the finer details of the face are entirely buried. At this stage let the operator bring to his aid the service of some kind friend, and, without altering the position of the sitter or moving from the same spot from where he viewed the effect, let his friend or assistant hold up slightly above the head of the sitter, at a point between the same and the window, the muslin screen described previously, and the very moment it is placed in position he will be surprised at the change that comes over the sitter's face, for not only will the side next the window, that was previously far too bright, appear to be beautifully softened down, but the shadow side will appear to immediately lighten up, and the dense shadows previously apparent will disappear, and detail spring into view that was entirely unseen before the screen was placed in position. And if at this stage the services of some simple reflector be brought into requisition, so that a somewhat front side light be thrown upon the front as well as the shadow side of the face, a marked improvement will have been effected, and, under such conditions, heads and busts may be well photographed in any well-lighted sitting-room; but it must not be imagined that full effect is capable of being given to every class of face in such situations, for this is really impossible with some kind of faces, where more or less top-light is required to yield lifelike results, and which can only be attained in properly fitted up studios.

In another branch of photography, *viz.*, copying, lighting also plays a most important part. Take, for instance, the photographing of oil paintings. Here, again, we see the need of having command over the light that is permitted to reach the object, for hardly any two pictures will be found that require exactly the same treatment, as, apart from the ever-varying range of colors met with, there are also great differences in the skies, some paintings have wide expanses of such and others none at all, and these large portions of what may be termed high-lights in a painting require to be specially treated in the way of lighting, otherwise these parts are hopelessly overexposed before the details in the darker portions are sufficiently brought out, and it is only by unwearied practice that anyone becomes expert in the copying of oil paintings. That very much of the success in this work lies in being able to have complete control over the light at command the writer well knows, for his experience, gained by photographing hundreds of oil paintings during recent years, has clearly shown that there is a best form of lighting for this particular class of work, and this will probably be found by those anxious to undertake the work in the direction of a top-light alone; but it must also be a very high-light, and the studio must also have plenty of length, so situated that sunlight never reaches it. With such a high top-light there is no difficulty experienced with reflections from the surface of the paintings, provided they are placed upon the easel in a vertical position and suitable material is spread over the floor. This is the natural outcome of a simple law in optics, and without a suitable light there will be no end of trouble in equally lighting the surface of any picture, and, in the case of oil paintings, any broad expanse of reflection is quite fatal.

The obtaining in monochrome of correct color value when photographing colored objects is quite a different matter now to what it was fifteen years ago. At that time the reproduction in monochrome of colored objects was considered wellnigh an impossibility, and what was attempted in this direction before the introduction of panchromatic plates was confined chiefly to the manipulation of the negative and the special treatment of same in printing.

These negatives were generally produced in a thin, fully exposed form, and were largely worked up by hand, such as the strengthening of high-light and half-tones, and also giving depth to the shadows, thereby lowering the tone of the colors which came out too prominently and raising others to their proper proportions. Although in the copying of oil paintings more or less of this kind of modelling is still practised, the wonderful improvements effected in the orthochromatizing of plates has tended to reduce the labor previously necessary to a very great extent, and now, with a well-appointed system of top-lighting and facilities for shielding certain portions of the objects, results are obtained far in advance of those produced years ago.

In connection with the photographing of numerous light-colored objects, such, for instance, as statuary, the direction of the main light, as well as the quality of the light employed, plays a most important part if pleasing results in light and shade are to be secured. It is quite surprising the difference in appearance such objects will present under varying dispositions of light.

With heavy objects, such as statuary, much difficulty is sometimes experienced when they have to be photographed in unsuitable positions. As a rule, however, a well-diffused top-light, backed up with, when necessary, an increase of reflected light at such points as bring into strong relief such parts as require to be portrayed as high-lights, will be found to yield excellent results.

Heavy statuary, as a rule, especially in all well-appointed public galleries, is never placed in situation without a considerable amount of thought being bestowed upon the manner in which it is to be lighted; but it will be found very often the ever-varying direction of the sunlight and daylight always yields a particular hour of the day when it is seen to the best advantage, and this should be closely studied when photographing the same.

In commercial work there are innumerable instances where special provision has to be made for certain objects, among which may be mentioned such articles as delicately formed fabrics, in which fine traceries are present, and in which also the design is represented by the form of the fabric, an instance of which we see in lace articles and fine embroideries. When dealing with many of these special provision must be made when stretching them, so that the design of the lace is not interfered with by excessive stretching, and this is best accomplished by using a special stretching frame, which only applies equal tension in all directions. Lace curtains, for instance, have frequently to be photographed for process work.

(*To be continued*)

ON THE ARRANGEMENT OF GROUPS

By SIDNEY ALLAN

TO take a satisfactory group is one of the most difficult tasks of portrait photography, largely because it represents the combined forethought and discrimination of as many efforts as there are sitters in the portrait. For a group is nothing but a combination of two, three, or more single portraits.

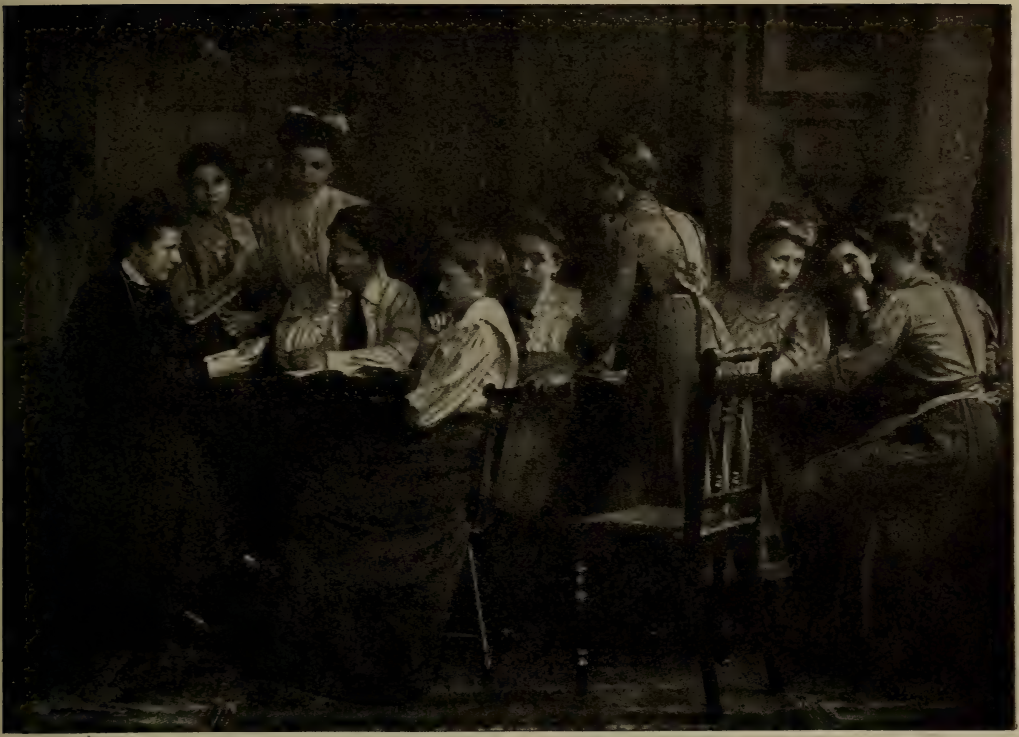
For that reason there is little to say about the detail arrangement of such portraits. The same rules that apply to the full front, profile, and three-quarter views should also guide the operator in the management of the various figures of a group.

The main difficulty lies principally, if not entirely, in bringing the conflicting elements together, to pose the figures in such a way as to form an harmonious whole. There must be some sort of connecting link. This is generally produced by some object in which the interest of the sitters is supposed to be concentrated. Accessories play an important part in the photography of groups.

In groups of more than three or four persons special attention must be paid to the "headline" (produced by drawing a line from the top of one head to the others throughout the whole group). There must be a certain swing to the line. If the headline is awkward the whole portrait is awkward. In the picture of Kubeler you see a modification of the first line, and in the famous Franz Hals portrait a *fac-simile* of the second.

Portraits of this sort are rarely attempted in ordinary studio photography. And for art's sake it is well that it is so, as they demand more knowledge, care, and time than most photographers would be able to give to them. The average pictures of outing and picnic groups only prove this too clearly. They are always stiff and absurd looking.

For portraits of two or three people there exists one rule which should never be broken. The heads should never be placed at the same height, unless they are symmetrically arranged, as on a book cover, for instance. It can be done in portrait photography only when the composition is exceedingly clever, as in Fig. 4, but the opportunities are rare. In all other portraits, even in Figs. 1 and



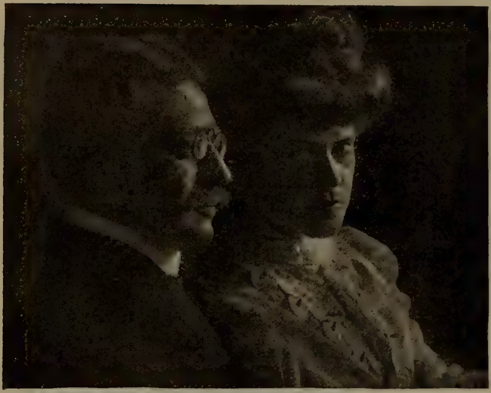
"ACADEMY GROUP" BY KUBELER

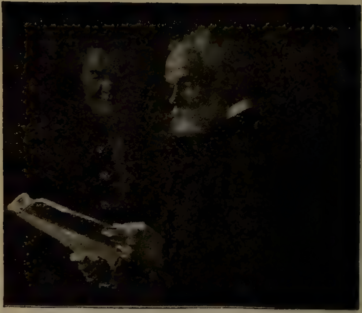
2, you will notice a slight variation of height.

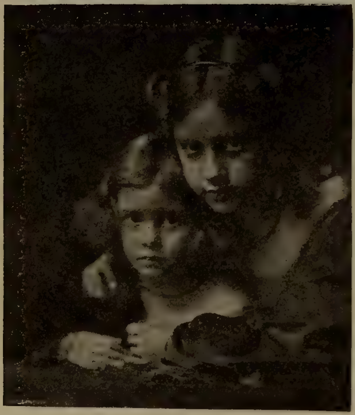
As for the combination of the different views of the head in group, almost everything is permissible. In Fig. 1 you have a combination of the profile and three-quarter view. This is about the most favorable arrangement for a bust portrait of husband and wife. The full front view arrangement is either silly or too sentimental. It is only suitable for children, as shown in Fig. 2, one of the best portraits Mrs. Kasebier has made. In the combination of profile and full front view, (Fig. 3) an object of interest is necessary. People do not sit at right angles and stare into space. If the head of the woman were turned, of course it would be different, but then it would become a variation of the theme in Fig. 1. Both heads in profile, as we see on medals, is too severe in effect to be specially recommended. It will serve only special purposes.

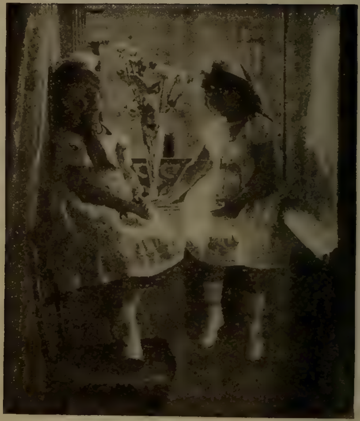
In groups of three people the possibilities of composition become exceedingly varied. It is, perhaps, best to follow some geometrical shape, as the triangle in Fig. 8, or the circle in Fig. 5.

In Fig. 6 you will notice a concave, and in Fig. 7 a convex, curve. Should you be bent on further notice, you will find out that the triangular form is really at the bottom of all these arrangements. The heads in all these four pictures form some kind of a triangle. In groups of four they often form some four-sided shape. And it is quite natural that it should be so. In a three-figure group there are three points of interest represented by the heads, and in a four-figure group, four. In composition one can never get away from the fundamental geometrical forms. A photographer should know this, but never lay as much stress upon it as some writers of composition have done. Cleverly composed groups repeat these laws, even against the will of the photographer; they come naturally. It is well, how-









1. PORTRAIT GROUP
BY FRANZ GRAINER

2. PORTRAIT GROUP
BY GERTRUDE KASEBIER

3. PORTRAIT GROUP
BY C. RUF

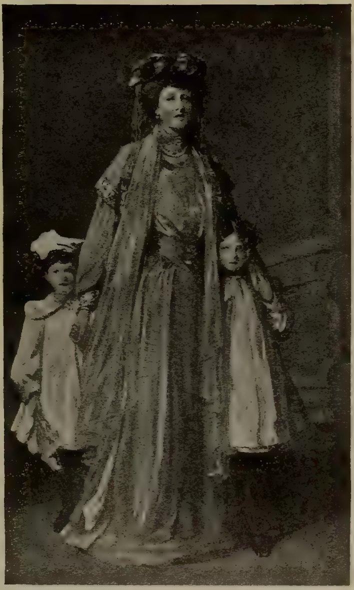
4. PORTRAIT GROUP
BY FRANZ GRAINER

ever, to know these things and to reflect upon them occasionally.

The children group, by Dührkoop, Fig. 5, is charming. Groups are specially suitable for children. Children are more diversified in their movements than grown people, and lend themselves more easily to a pictorial composition. It is difficult to make two or three grown people look as if they were occupied in a half way sensible manner. Every operator of experience will agree on that point.

Fig. 6 is, in a way, a masterpiece of home portraiture. The figures are well posed and the handling of accessories (there are almost too many) is perfect. The more unconventional the poses are in group the more natural an impression they are apt to give.

Fig. 7 is a trifle stiff, but it is noteworthy for the successful management of three profiles. In three-figure groups, an object of interest, as in this picture, is almost indispensable. Grainer avoided it by the introduction of an exceedingly clever light arrangement. The only other way is to make them decorative in tendency, as shown in the Lavery portrait, Fig. 8. The figure is rather profusely garbed, but draperies always help a portrait. A lady in a tailor-made dress would not look well in this pose. The figure is slightly bent forward, as if walking. Also, this helps the composition. One cannot simply place full-length figures beside each other and hope to make a successful portrait. The painting by Zorn of himself and his wife (in my chapter on standing positions)



5. PORTRAIT GROUP
BY R. DÜHRKOOP

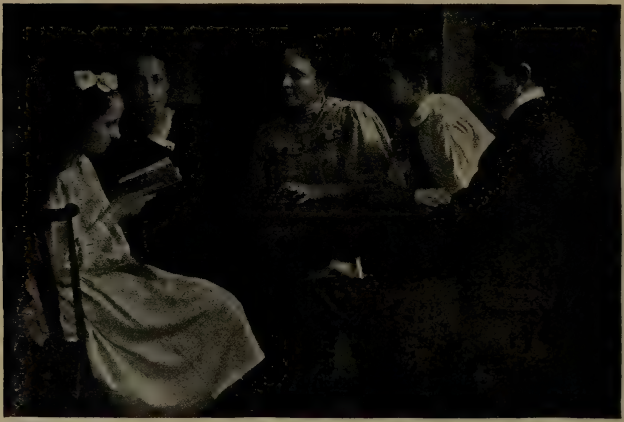
6. PORTRAIT GROUP
BY FRANZ GRAINER

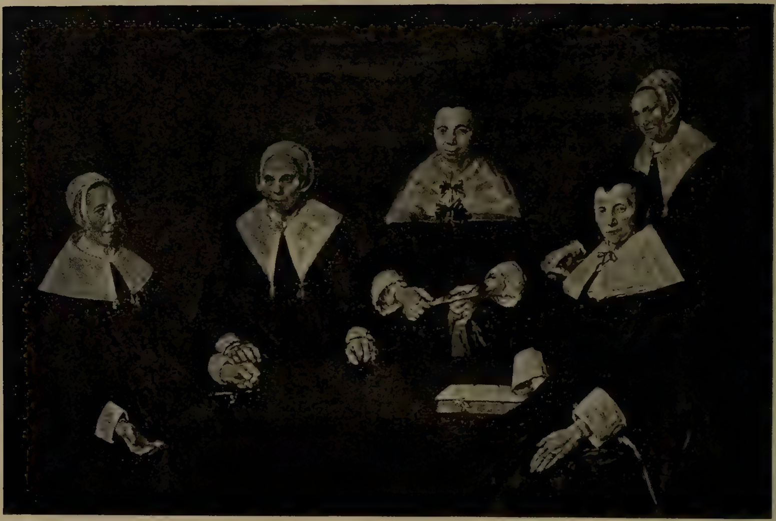
7. PORTRAIT GROUP
BY KUBELER

8. PAINTING
BY JOHN LAVERY

is one which only proves the rule. In groups the people must do something or be interested in something, or the result will in nine out of ten cases prove unsatisfactory.

Fig. 9 is one of the most successful five-figure groups I have ever seen. This Darmstadt photographer seems to have a rare faculty for taking groups. He has made a specialty of it. Of course, I could point out a few minor shortcomings—the headline is a trifle too straight and the figure of the young man at the right a trifle too large—but it is in every other respect just what a photographic portrait group should be: a simple composition, without any groping for an elaborate "artistic" effect. Whether the likenesses are good, of course I cannot say, but they convey the impression of being natural and in no way strained. As soon as a person is occupied, no matter in





9. PORTRAIT GROUP
BY KUBELER

10. SUPERINTENDENTS, OLD WOMAN'S HOME
BY FRANZ HALS

what way, the facial expression changes, and a *straight* likeness, as in a bust portrait, becomes impossible. All you can hope to get is a more intimate and individual, but less typical, expression.

In the portrait of the "Superintendents of the Old Woman's Home" there is no object of interest. Four of the women stare straight into your face. Franz Hals simply painted five portraits and pitched them together. And I do not know whether that is not the wisest way. As I have said at the start, a group portrait is nothing but a clever combination of several single portraits. And the combination in this instance is accomplished solely by the headline. Every figure (four of them at least) would furnish a portrait satisfactory in itself; they become an harmonious entity solely by space arrangement, *i. e.*, the way in which they are placed and related to each other.

IMPROVEMENTS IN OPTICAL AND ENLARGING LANTERNS

By ANKETELL HENDERSON

FOR over forty years the writer has used, when lecturing, a projection lantern with two lenses, one about 7-in. and the other 1½-in. focus, and by having a slotted frame for the slide carrier near the lenses and reversing a nose-piece carrying the lenses, he has been enabled with the 1½-in. lens to project portions of the slide at increased magnification, often, in the case of buildings, nearly up to full size. By using the lantern slide in a special carrier and covering with velvet the inside faces of the slotted frame, the carrier and slide would remain stationary, and any portion of the slide could be examined in detail, focussing being effected by an arrangement like a focussing jacket. The writer will never forget the cries of delight from the audience when he first used this arrangment, showing the porch details of Amiens Cathedral about one-third full size on a big screen.

For many years the 1½-in. lens was used with this lantern for enlarging special portions of negatives, both portraits and buildings.

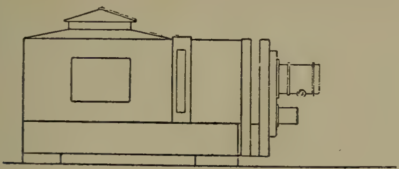


Fig. 1.

Fig. 1 is a sketch of this projection lantern, which is an invaluable instrument to anyone lecturing on technical subjects. As the position of the light had to be a little nearer to the back for the illumination of the 1½-in. lens, a stop for each position of the light was provided in the lantern base, and the change could instantly be effected by a pull or a push. So far as the writer knows, no similar instrument has ever been described.

About eight years ago this principle was applied to an enlarging lantern, the bellows being removed and a series of slotted frames substituted to hold the negative-carrier at different distances from the condenser, and so allow shorter focus lenses to be used: with the 1½-in. lens before mentioned, nearly full-size heads could be obtained from large group negatives. Further, vest-pocket negatives could be placed in the slot at a bright portion of the cone of light away from the condensers, and with a 3-in. lens enlargements made in half the time.

A further improvement was made this year. The bellows of the enlarger was not removed but cut in two halves, and an extra and movable slotted frame for the negative-holder was provided. This was carried by two brass tubes fitted with racks and passing through the usual fixed slotted frame, and actuated to slide to any position by a pinion at the back of this frame. This extra frame was made of sheet brass with square holes, and stiffened by angle-edges, into which the bellows folded when contracted. In a new enlarger the extra slotted frame could be carried by an upper slide in the enlarger base, the lens board being carried by a lower slide, this being cheaper than brass rod and double racks, etc.

This improvement in the enlarger has given the writer so much pleasure that he hopes others and manufacturers will adopt it. Bits out of old negatives often give charming pictures, and faces out of groups, especially children, have given a new interest to photography.

Fig. 2 is a sketch of the new enlarging lantern, which is shown with parallel bellows. It works with tapered bellows if the taper is not too great. The thinner the material for the bellows, the greater the range of effects.

As to lenses, the writer generally uses three—1½ ins., 3 ins., and 6 ins. Each lens is fitted with a lens board, and it takes about half a minute to change from the 6-in. lens, giving nearly five diameters, to the $1\frac{1}{2}$-in., giving about sixteen diameters. The $1\frac{1}{2}$-in. was a "Pistolgraph" lens made by Dallmeyer, aperture *f*/2, for which the writer gave its weight in gold about forty-three years ago. Dallmeyer's Cameo lens, about 2 ins., has been used by one of his friends. Good cinema lenses of 2-in. focus can often be picked up. For vest-pocket negatives the writer uses an Aldis 3-in., with excellent results. A slight alteration of the lens board would allow the V.P. camera itself to be used for projection if the lens were a doublet.

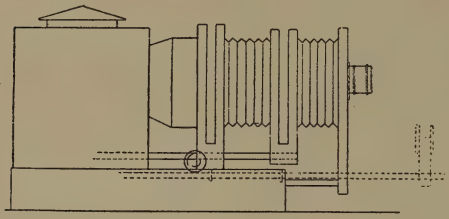


Fig. 2

When diffusion is required in the enlargment, many use a cap on the lens, perforated and covered with chiffon, but this gives no latitude. By inserting a frame covered with chiffon in the central slotted frame and racking backward and forward, diffusion can be varied at will from a bare diffusion to a great one. By using a frame of white chiffon a wonderful softening of a hard negative can be produced.

The writer experimented with an enlarger with two moving intermediate slotted frames, so as to be able to use chiffon when enlarging with shorter-focus lenses, but found the two awkward to handle in a darkroom, and does not recommend more than one.

Another convenience of the new arrangement is the use of a vignetter in the intermediate slotted frame, as, by racking backward and forward, the vignette is enlarged or contracted at will.

The writer's vignette consists of a wooden frame to fit the slot and open at the top. The vignetter hangs by hooks from the top bar of a wire frame sliding in grooves in the wooden frame, and the wire frame may have a rack actuated by a pinion to raise and lower it. The vignetter consists of a metal plate with a large opening in the center. The edges of the plate are folded over to form a frame to carry the vignetting card suitably perforated to the shape required. The bottom of the plate is weighted with lead or other metal, and as it swings backward and forward on the top wire of the inner frame it gives the necessary softening of the vignette on the easel.

Fig. 3 gives an isometric sketch of the vignetter.

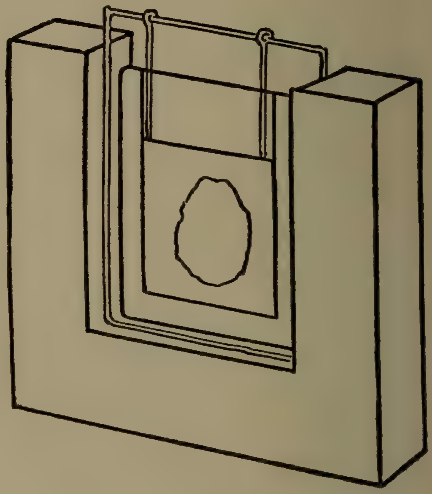


Fig. 3.

To use the vignetter, or diffuser, when the intermediate slotter frame is in use the writer uses a cantilever frame to carry the vignetter or diffuser. This consists of two brass tubes united by a bar of wood in front, the back of the tubes passing through eyes screwed into the base of the enlarger. This cantilever is shown dotted in Fig. 2, the top of the front bar being level with the bottoms of the fixed and moving slotted frames.

One of the adjustments liable to be forgotten when enlarging is the focussing of the light after the negative is focussed. It involves the taking out of the negative holder and replacing it, and sometimes recentering of the negative.

The writer first experimented with levers of various shapes to focus the light automatically, and about ten years ago adopted a simple straight lever—even for the smallest size of incandescent burner he finds the straight lever efficient for focussing the light. A strip of brass, a few screws, and some stout brass wire are all that is required in most cases, and the following simple operations all that are necessary.

First focus the negative and then the light for an enlargment of 1½ in. diameter, say from a quarter to half-plate, and mark the position of the light-tray and the lens-carrier respectively. Second, focus the negative and then the light for an enlargment of, say, four diameters, and mark the new positions of light-tray and lens-carrier. Both will be found to have moved an inch or more, and both in the same direction. With a 6-in. lens the movement will be about 2½ ins., and with the usual condenser the movement of the light-tray will be something less. Let us assume 1½ in. To ensure proper focussing of the light we must connect lens to light by a lever to move in these proportions. The author has found that a lever about three times the length of the largest of these dimensions to be a good proportion. Multiplying 2½ and 1½ by 3 gives 7½ and 4½. Take a strip of brass about 8½ in. x ⅞ in. x $\frac{1}{16}$ in., and drill two holes, *A* and *B* (Fig. 4) 7½ in. apart, and with a screw through end *A* pivot the lever to the base of the lantern (under the condenser is preferable) and connect the other end *B* by a stout wire to the lens board. At 4½ in. from the pivot end drill a smaller hole *C* and connect by wire to the light-tray. The light-tray should be made to slide easily. The wire connection may be made under the lamp box or inside the lamp box, as most convenient, and it is advisable to use in the measurings the longest focus lens you use, about 6 in. for a ¼ plate.

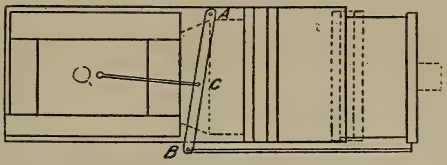


Fig. 4.

When this is completed we shall have an optical system in which the light is always in proper focus for the projecting lens in any position it may be required, and any shorter focus lens may be substituted for the usual projecting lens, if provision be made for the negative carrier at a suitable distance for the lens, as can be done with the improved enlarging lantern just described.

TEN RULES FOR EFFICIENCY

BE inspired by and work for love of work.
Anticipate requirements and develop resources.
Know both sides of the question and eliminate errors.
Master circumstances, recognizing no impediments.
Be courteous ever, permitting reason to modify rule.
Do the right thing, in the right way, at the right time.
Do things better than they were ever done before.
Achieve nothing short of perfection.
Know what is to occur, whether it occurs or not.
Be a confirmed optomist; don't worry about what happens, but see that it doesn't—to your people.—*The Express Messenger.*

MAKING COLD-PROCESS STRIPPING PAPER AND PLATES FOR DEVELOPING OR PRINTING-OUT BY HAND OR MACHINE

By ALFRED J. JARMAN

Part V

WHEN transparencies for coloring in oil colors have been made either by the use of stripping paper or upon transparency plates, and a surface given to the plate to form a tooth for the color by the use of a matt varnish, as has been previously described, there may arise a time when it is found necessary to remove the coloring and the varnish, too, so as to commence the coloring over again. Therefore it will be necessary to remove both varnish and paint, so as to have the photographic image and the gelatin forming the film intact—or in other words, so as to leave the transparency uninjured—so that it may be revarnished, or a grained surface produced with the tooth required, by any of the means already described.

The following preparation can be depended upon to accomplish the desired object, because the component parts are solvents for the gums used in the varnish, and also for the oils and sizes used in the oil colors as carriers of the various pigments.

Oil Color and Varnish Remover

Spirits of turpentine	2 fl. oz.
Benzine	1 fl. oz.
Sulphuric ether	1 fl. oz.
Wood alcohol	1 fl. oz.

A small tuft of soft rag is well wetted with the above and rubbed all over the surface. A small quantity may be poured upon the plate, and a second tuft of rag used to wipe the plate well all over. It will be found that this rag will nearly clear the entire surface, which has become a little sticky with traces of the gums. A third application will be found necessary to rid the surface completely of oil and gums, when it may then be rubbed softly all over with a clean soft rag, or canton flannel, and be ready to be treated again to secure the desired surface. Notwithstanding the plate has been previously coated with matt varnish it may be now treated with the weak ammonia solution and a piece of china silk squeegeed thereon, thus obtaining the excellent surface tooth that this material will render when stripped from the plate when dry.

Making Stripping Paper or Plates for Printing-out

Emulsion No. 1

A

Distilled water	6 fl. oz.
Ammonium chloride	12 gr.
Rochelle salt	23 gr.
Citric acid (crystal)	45 gr.

Stir this mixture until the salts have dissolved, then add:

Am. Glue Co.'s hard gelatin	384 gr.

Allow this to soak for half an hour, then melt by placing the small stoneware crock into water, which must be brought to boiling-point.

Prepare the following, ready to hand:

B

Pure nitrate of silver	68 gr.
Distilled water	2 fl. oz.

C

Powdered alum	45 gr.
Distilled water	2 fl. oz.

Under a deep-colored orange light add the nitrate of silver solution B, a little at a time, stirring well with a strip of glass or a glass rod; rinse the vessel that contained B with one ounce of pure alcohol; then add the alum solution C, which should be made hot to boiling-point in a glass flask, stirring well during this addition.

The emulsion may now be cooled until it assumes the form of a stiff jelly, when it must be squeezed through canvas in the same way as for the previously described emulsion for developing paper and plates, and washed in five changes of clean cold water, and drained well for an hour, when it may then be melted, and 2 drams of the following solution added while in a melted state:

Distilled water	2 fl. oz.
Pure nitrate of silver . .	120 gr.

As soon as two drams of this solution have been added, and one ounce of pure alcohol, the emulsion must be filtered in the same way as previously described for bromide and chloride emulsions, when it will be ready for use in coating the paper for stripping or for plain coated glass plates, for printing-out, or for printing-out stripping plates. The small quantity of nitrate of silver added to the emulsion is necessary, because free nitrate of silver is required in this class of emulsion to procure a clear, brilliant image; without it the result would be a poor, weak image, wanting in brilliancy and force. The resulting photographs, produced upon either paper or plates coated with this emulsion, are excellent in every particular.

Should greater brilliancy be desired and a strong contrast result be looked for it may be obtained by using a small quantity of the following emulsion in conjunction with the one given, mixed at the time of coating:

Emulsion No. 2

A

Distilled water	3 fl. oz.
Am. Glue Co.'s hard gelatin	192 gr.
Ammonium chloride (C. P.)	6 gr.
Rochelle salt	12 gr.
Citric acid (cryst.) . . .	23 gr.

As soon as the gelatin has become well soaked, it may be melted in the same way as for the previous emulsion, and the following solution prepared in a glass flask or graduate:

B

Pure nitrate of silver . . .	35 gr.
Distilled water	1 fl. oz.

When the nitrate of silver has been dissolved by stirring, add very cautiously, only a drop at a time, strong water ammonia, stirring the while with a glass rod, until the brown precipitate of oxide of silver is nearly but not quite dissolved; then add this to the hot A solution of gelatin; rinse the vessel with half an ounce of pure alcohol, as in the previous emulsion, add this also, and in addition the following in a boiling hot state:

C

Powdered alum.	23 gr.
Distilled water	1 fl. oz.

Stir this well, set aside to become cold, when it must be wrung through canvas as in the previous case, washed and drained and kept ready for use. To secure extra-brilliant images, add a small portion of this emulsion in shreds to the No. 1 at the time of melting, in quantity about one ounce by weight. Of course, all these operations must be carried out under the deep-orange colored light, as in all the other instances of emulsion work.

It will be observed that this emulsion differs widely from the No. 1. It will present an intensely dead-white appearance and be very stiff in general texture, but the effect will be very marked in the resulting prints either upon glass or paper, and at the same time the printing will be much more rapid, because the addition of this small quantity of highly sensitive emulsion has added a new quality, which will be well marked in the resulting photographs. Plain baryta-coated paper may also be coated with the No 1 emulsion, which will give excellent prints by printing-out from any good negative.

Any prints made with the above emulsions must be well washed after printing, and toned in a suitable gold toning solution to secure the best effects, and also aid in the production of permanent photographs.

The printing-out emulsions given here will keep in good working condition, after being washed and in a shredded state, for about two weeks if kept in a cool place, protected from light, and away from the sulphurous atmosphere of burning gas or coal or coke fires. It will be advisable, however, to use these emulsions as soon after being prepared as possible to prevent any discoloration taking place.

When the prints are made upon stripping paper or plates that have been coated with printing-out emulsions they must be washed in several changes of clean cold water, to rid them of the trace of free nitrate of silver, before toning. In either prints upon paper or plates they must be made a shade or two darker for paper, and much deeper for transparencies that are to be used for window illumination. Those that are to be used to paint in oil must be printed somewhat lighter, so that all the half-tones may be viewed in a perfect state when the oil colors have been applied.

The printing of a transparency upon a glass plate, either plain or stripping, is best accomplished by placing the plate to be printed upon the negative, then attaching one to the other by means of a strip of passe-partout gummed paper along the side or longest edge. As soon as the gummed strip has become dry, place both in an ordinary printing frame, and expose to either daylight, sunlight or a powerful electric arc lamp (daylight is preferable). After a few minutes' exposure the progress of the printing may be ascertained by removing the negative and plate together, when they may be opened like the opening of a book, and the print examined. If it is not printed sufficiently deep the plate is allowed to fall over upon the negative again and is placed in the printing frame, and a further exposure given. It will be found that by means of the paper hinge the plate and negative register perfectly. It will be found that by adopting this means of printing that twelve good prints can be obtained from one dozen plates, owing to the progress being easily observed and the right depth of printing obtained. The following toning processes will render perfect prints after fixing, washing and drying:

Toning the Printed-out Image

No. 1

Distilled water	20 fl. oz.
Chloride of gold	2 gr.
Acetate of soda	60 gr.
Bicarbonate of soda	20 gr.

This solution must be made and stood aside for twenty-four hours before using.

No. 2

Distilled water	20 fl. oz.
Sodium phosphate	24 gr.
Chloride of gold	8 gr.

No. 3

Distilled water	20 fl. oz.
Chloride of gold	4 gr.
Saturated solution of borax	3 fl. oz.

After the prints have been washed in several changes of water, they may be placed in the No. 1 toning bath and turned over several times to ascertain the color. If a rich brown is desired, then a faint change only from the reddish tint they presented when washed will suffice. If a purple brown is desired, the toning may be carried a little further. The prints must be placed into clean water as soon as toned, the water containing half an ounce of common salt to the gallon. This is to prevent the toning being carried further. Paper prints or glass plates are treated the same, the glass plates being placed in the grooves of a compo or hard-rubber fixing-box, filled with the salted water if there are a number of them.

Fixing the Prints

The following fixing-bath serves well for this purpose.

Hyposulphite of soda	8 av. oz.
Water	40 fl. oz.
Hardner	1 fl. oz.

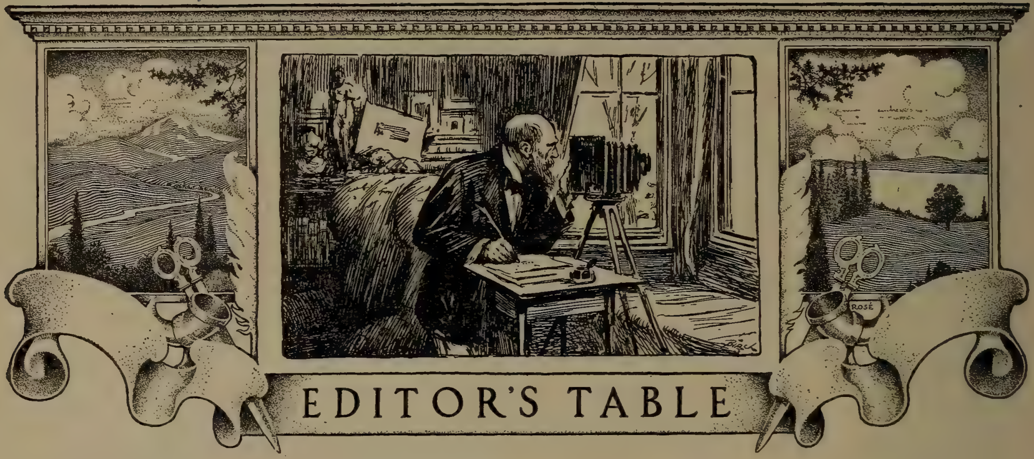
The prints must be allowed to remain in this bath for not less than ten minutes, this will ensure complete fixation. They must then be well washed in a number of changes of water from tray to tray, ten or twelve changes, allowing a few minutes to elapse before each change. They may then be dried, or they may be transferred while still surface dry by the same means as described for developed stripping films.

Glass transparencies must be both fixed and washed in the grooved boxes to prevent their being scratched or injured. The washing is best accomplished by placing the plates in the grooves, then filling the box with water, allowing them to stand a few minutes; then, by placing the hand over the top of the box, drain the water off and refill the box again, until the washing is complete. Each plate, then, must be carefully wiped over the face with a tuft of absorbent cotton wetted, while the water is permitted to run from the faucet over the surface during the wiping process, then racked to dry, or, if the graining process with silk is to be employed, it may be done then. If not, the plates must be dried and treated as desired after drying.

The use of the acetate gold toning bath only has been mentioned. The merits of the other toning baths described are as follows:

The No. 2 phosphate bath will give beautiful purple tones, quite even in color; but it will last only once, it will not keep, a new bath being necessary each time of toning. The acetate bath may be used a number of times by the addition of a small quantity of chloride of gold solution each time it is used (a grain of gold chloride to an ounce of water will be found to be the right proportion), an ounce or two being added at the time of toning. The discoloration which takes place is of no consequence; in fact, the richest colors are obtained with this bath when discoloration has set in. The No. 3 bath is also a very good one. This bath may be used as soon as it has been mixed, and may be used over and over again by the addition of a small quantity of gold solution each time it is used. Excellent tones may be obtained with this bath—light brown, sepia and dark brown—depending upon the depth of color at the time of toning.

The processes described in these articles may aid the photographer in a new and separate part of his business, inducing customers to patronize this class of work, which nearly approaches an oil painting, as well as opening a new line for the supply of frames of good quality and price, thus adding not only new customers but also a new avenue of profit to the enterprising photographer. Any portrait may be copied for the production of an oil-painted transparency. Many persons may be induced to have one of these excellent portraits made of departed friends, while the amateur can produce by these means imposing pictures of quality to suit the taste of those who are artistically inclined.



THE VALUE OF THE NEGATIVE

FEW things are more persistently dinned into the ear of the photographer than is the necessity for advertising. To make known both name and work, energetically and persistently, is accounted a good and a necessary thing. And so, doubtless, it is. But to attract a new customer might almost be described as a means to an end rather than an end in itself, the real end being the *retaining* of the customer. The photographer who fully understands the business end of his profession knows that the names on his books, the names of people who have sat for him, form one of his most valuable assets.

There seems to be still too much survival of the old idea of value inherent in a negative. The negative is not without value—some negatives are exceedingly valuable, as are some collections of negatives; but speaking of the whole question, too much value is placed on the stock of negatives, and too little value on the legitimate possibilities of a clientele. The hoarding of negatives dates from a time now old-fashioned and in many ways effete. *Then* the sitting for a photograph was an event—often of a lifetime; and once a record was obtained the photographer scarcely expected to see his sitter again in a business way. *Now* he takes his sitter, and there is no reason why the sitting, especially if of a lady or of a child, should not be repeated at the end of two years, or even earlier. In the old-time days of one negative per lifetime that negative had a reasonable probability of being again required when the person portrayed was dead. Today this value is much more problematical.

Negatives are still worth storing, but the original is better worth cultivating rather than waiting for an order from children or heirs.

And in line with this question of repeating sittings at intervals comes that of the immediate value of the negative. Very many photographers welcome a sitter to the studio, take an order and that is the end of the matter. By a judicious treatment of the sitter the initial order can often be increased, and, although it is not the rule, yet many negatives may be used, in a comparatively short time after they have been made, as a means of again approaching the customer.

The question, therefore, is moved from *getting* the customer to *pleasing* the customer.

First and foremost, in spite of what pessimists and cynics say, good work must be considered. Even among photographers jealousies are not unknown, and the successful man is often criticised in the quality of his work. And the criticism—or perhaps we ought to say condemnation—is usually wrong. The work may be "different," but in its own line it is probably good, however orthodox or however visionary our ideas.

Next to good work, a good business

system is necessary. Every name of a customer should be carefully indexed, and the index should be systematically gone through. By letter or by other means these people should be kept in touch with the studio. The plan of glorifying what used to be a mere "reception-room" into one of the fashionable lounges of the town is one of many methods of holding the interest. And such a method has the distinct advantage that it keeps the customers in actual personal touch with the studio, which is better than any mere postal connection. Only a limited few can follow this to its full extent, but all can do their best to make the reception-room tastefully attractive.

We think the success of the fashionable lounge idea hinges not a little on the point of being "asked to buy." When a person comes on business bent he or she should have prompt attention. But for the rest they should, as much as possible, be allowed to come and go. If a lady has the habit of meeting a friend at the studio, she may call twenty times in a year and can scarcely be expected to sit for her portrait every time—or every tenth time.

Perhaps the man who more than any other needs to keep close track of his customers is the man who is in a very small way of business. The man who has larger capital invested and who can employ a staff of assistants often has his business system thoroughly arranged and understood. The smaller man too often makes a spasmodic effort when business is not moving satisfactorily, and at other times lets things take their course. His method is very often too general. It is all right to flood the town with handbills, offering coupons or special advantages; but there should be an additional special effort to those who personally know the studio. Five thousand circulars scattered broadcast will hit perhaps five hundred people, and twenty of these will drift into the studio as a direct result; others may come afterward, unconsciously influenced by the bills. But five hundred rather more careful bills or letters to a selected list, and in some way intimating that their former visit is remembered and appreciated, will draw a much larger proportion of interest and probably an actually larger result. The neglect of properly working this list of preferred names must in the aggregate lose thousands of dollars to the fraternity.

By all means attract all the new trade possible; but once a customer is obtained, make that customer a friend and stick to him.

PRACTICAL PAPERS ON STUDIO WORK AND METHODS

Keeping Customers Waiting

In many studios you go into you will find that one man, with possibly his wife or an assistant, is trying to do all the work. It may be true that they can do all the work that the studio has at the present time. But just stop to think a moment: Suppose you go into a place of business expecting to spend anywhere from ten to twenty-five dollars. You look around the store, no one in sight, and a voice from somewhere in the distance says, "I will be out in a moment." You do not know where it comes from; you wait anywhere from one to ten minutes, and then someone appears, wiping his hands, coat off, etc. What is your impression of that store? Now, stop to think what impressions customers may have of your studio when they come in and find there is nobody in the reception room. People get the impression that your studio is badly managed; that you haven't business enough to hire a receptionist; that you are slow, and while on account of being friends of yours, or having been sent to your studio by some one else, they will wait, they do not receive a good impression of you, your studio or your business. Do not think for a moment that you are gaining anything by keeping people waiting, for you are not. *You lose out in dollars and cents and reputation every moment a customer is waiting for you.*

One man said that it took as much courage for him to go to a photograph studio as it did for him to go to the dentist's office, and you known what it means to go to the dentist's office if you have a toothache. The moment you step into the office the toothache stops, and if you had to wait around about a half hour for the dentist to show up you would go home. So he said when he went to a studio and stepped into a cold, dark and disagreeable room and found it vacant, he lost his courage and did not care whether he had his picture taken or not.

If you want to make money in your studio, have someone in the studio all the time to greet your customers when they come in.—*American Photographer.*

Portraits of Elderly People

It is bad form now to talk of old people, so that I have gone as far as I dare, and only describe the class of sitters I deal with this week as elderly, and with these I do not class the lady immortalized by W. S. Gilbert, who "might very well pass for forty-three in the dusk with the light behind her." People who have left the fifties behind may still possess a large reserve of strength and activity, but, unless artificial aids are freely made use of, carry their age in their faces, and present a different set of problems to the photographer from those which he meets with when photographing those who are still youthful or in what is commonly called the prime of life. Fortunately, most are conscious that they are no longer young, and do not demand the same class of picture as they would have done at an earlier stage in their lives, so that the photographer is at liberty to deal with them so as to produce a good portrait rather than to endeavor to make a "pretty picture," and as nearly all have more or less picturesqueness or dignity this should not be difficult.

One of the greatest errors that can be made is to endeavor to obliterate the traces of time and to produce a picture which is neither like the sitter is nor was at any previous stage in his life; but on the other hand, the photographer must make the best use of his opportunities, and not make the evidences of age more apparent than he can help.

The first difficulty to be met with is, of course, the color and texture of the skin, and under this heading I include wrinkles. It is a good plan to start with the determination to leave as little as possible to be done by the retoucher, securing, by judicious lighting, appropriate lenses and color-sensitive plates, a negative which should be almost satisfactory without any handwork upon it. Most elderly folk have more character in their faces than young ones have, and therefore we may start with a softer, more diffused light, without danger of sacrificing the necessary relief. Although I do not, as a rule, care for dividing the light into two parts, with this class of sitter it is sometimes advisable to do so, using a good deal of rather low front light to illuminate wrinkles, and then admitting a small amount of top light nearer the sitter to give the necessary modelling. This lighting will also be helpful in the case of deeply set eyes and hollow cheeks. When using artificial light the best results can often be obtained by using only reflected light or a combination of reflected and direct light, such as is provided by the enclosed arc and Jobson reflector. What we have to avoid is the production of a "railway man" effect which has to be retouched out of all knowledge before it is at all acceptable. There are some old people with faces of the "Pickwick" type who can be photographed without special treatment, but they form a small minority and do not make nearly such interesting portraits as those with features of a more rugged type.

Next in importance to lighting comes the quality of definition given by the lens. There are many lenses which would have been pronounced "bad" a few years ago which are excellent for our special purpose, for they are incapable of giving sharp definition, and take the edge off the lines and wrinkles in a very satisfactory way. It has in my time been my fate to be photographed by many of my friends with almost every type of lens, from the Bergheim to the most carefully corrected anastigmats, and I must say that I much prefer the "soft-focus" results, provided that they are not too soft. The avowedly soft-focus lenses, such as the Bergheim and the Portland, tend to give too much diffusion in small sizes to be pleasing to most people, and I therefore recommend the use of a portrait lens such as the Dallmeyer, Cooke or the more recent models of Ross as being most suitable for general use. With these any desired amount of diffusion can be obtained by increasing the separation as directed by the makers, but I would recommend anyone starting to use one to make a few trial exposures, noting on each the degree of unscrewing which has been done. It is not easy for one accustomed to sharp images to judge the printing quality of the diffusion by looking at the image on the ground glass, but if we have a set of negatives marked half-turn, one, two, or three turns, we can adjust our lens to one of these, focus as sharply as possible, and make sure of our result. If such a lens is not to hand, a very good substitute may be found in the front combination of an ordinary Petzval portrait lens, which gives a very pleasing softness, obtainable in two degrees according to the position in which it is used—that is to say, that if used with the convex side turned to the sitter a less degree of diffusion will be obtained than if it is turned round so that the flat side faces the sitter, but this is not a discourse on soft-focus lenses, and I must pass on to other points, prominent among which comes the question of the color of the skin.

From various causes most people lose the pink and white of youth at a comparatively early age, and by forty the majority have taken on rather a non-actinic tint. This, of course, tends to accentuate the depth of the shadows and to make it difficult to illuminate the face properly. Moreover, in healthy subjects there is often a mottling of the skin with little red veins and patches, which, while not unpleasing to the eye, give a very rough and uneven effect in the negative when ordinary plates are used. For this reason I strongly advocate the use of orthochromatic plates in conjunction with a yellow filter, which reduces the color contrasts to a minimum. Even better results may be obtained by using panchromatic plates with a K2 filter, which practically eliminates all the rough effect caused by red veins and yellow patches on the skin, and give images which hardly need any retouching except to modify the features or to correct the outlines; they also give an excellent rendering of faded blue or gray eyes, which usually appear as too light in the print. I have used the red filter of a trichrome set, but this gives an over-correction, and by practically eliminating all color contrasts in the face gives an almost marble-like rendering. It may be feared that the exposures may be unduly prolonged by using a filter, but this is not so serious an objection as might be anticipated. Granted that a filter will require double the exposure being given, this can be overcome by using a larger stop and being more careful in focussing. Moreover, elderly people are usually good sitters, and will generally stand double the exposure usually given without moving, especially as the poses are almost always sitting ones.

Bald heads and white hair call for a word or two. Both need a little local shading, and for this a small head screen is useful, care being taken to place it so as to cut the light off the top of the head only, without interfering with the lighting of the features. The screen should be very thin—fine lawn being the best material, and this should be quite clean, so as to obstruct the minimum of light.

Spectacles are sometimes troublesome, and often preclude the choice of poses, but reflections must be avoided, as no matter how skilfully the eye is spotted-in, the effect is never quite natural. I would caution anyone against adopting the old dodge of using empty frames instead of retaining the ordinary glasses. Most spectacles either magnify or diminish the size of the eye, and friends become accustomed to this appearance. When the glasses are absent the effect is altered, and, in addition, the loss of them causes a strained expression, as the sitter can no longer see clearly. If the lighting can be managed without using a reflector, the risk of getting reflections in the glasses is minimized.

I have already mentioned the desirability of reducing retouching to a minimum, and this must be judiciously applied, the all-over style of working being very objectionable. The pencil should only be used to soften lines and spots, not to obliterate them. In many cases, especially with large heads, a piece of celluloid or even a very thin glass placed between the film side of the negative and the paper when printing will give a pleasing softness which takes the sharp edge off the definition, and saves much work.

Many of the most successful portraits of old people are those made "at home." The sitter is spared the effort of visiting the studio, and generally is in a more comfortable frame of mind among their usual surroundings. With the rapid plates now obtainable quite short exposures may be given in an ordinary room, especially when a good $f/4.5$ lens is used. Going out in this way means extra time and work, but I do not believe in making any considerable additional charge for it, provided that a decent order is given. Very often in such cases it is the last, if not the only, portrait the sitter has had taken, and re-orders, some perhaps for enlargements, miniatures, and the like, will probably come in, so that nothing should be done to discourage such business if the opportunity of doing it is offered. —*B. J.*

VIEWS AND REVIEWS

Speakers at the Middle Atlantic States Convention, Atlantic City, February 17, 18, 19, 20, 1920

O. E. Titus, of York, Pa., will give a demonstration of Portraiture made with artificial light, employing the indirect lighting system. He will demonstrate different means of obtaining results with a minimum amount of light. He will also give a talk and a practical demonstration of the use of different lenses.

William C. Noetzel, of Newton Center, Mass., a wonderful workman, will make a demonstration of modern lighting and pictorial arrangement. He too will use electric light and will give us some new stunts. Mr. Noetzel will have the assistance of his wife in his demonstration, which will furnish practical proof of the valuable assistance a photographer's wife can be to him in his work, especially in the skylight room.

Mr. Noetzel's demonstration will be most interesting as he is one of the very best workmen in the country. His demonstration will be original, modern and profitable. Mr. Noetzel will also have an exhibit of his work for the exhibition hall.

Joseph Strickler, of Pittsburg, Pa., will be another demonstrator of portrait work. His demonstration will be along different lines from the others so we will have the benefit of different styles of workmen, all of which are very good.

William (Bill) Armstrong, of Toledo, Ohio, will give us a practical demonstration of his own way of working. Bill is a live wire and will show us some stunts for getting the money.

Mr. Bernard, of the Campbell Studio, New York, will give us a talk on studio efficiency. He is very clever in this respect and will give us the benefit of his experience in holding down expenses and making the business more profitable. You cannot afford to miss this, for it means dollars to you.

Mr. Rose, of Toledo, Ohio, will give us an illustrated talk on commercial photography. He will cover this subject from the making of the pictures to the getting of the long price for your work. Mr. Rose has a very fine business and is well able to give first hand information which will be of value to all commercial workmen.

Paul L. Anderson, of New York, will give us a practical illustrated talk on composition in portraiture. Mr. Anderson, while an artist with the brush, is also a photographer and he has written a book on composition in portraiture which is the most valuable work on the subject I know. His lecture will be most interesting, more so for the reason he knows what the photographer is up against many times in his work and therefore has many suggestions to help him. No one can afford to miss Mr. Anderson's talk.

J. C. Abel, of *Abel's Weekly*, will give us a talk on the business and financial side of photography. Mr. Abel has traveled a great deal among the different studios and has been able to observe the things that are of vital interest to the photographer. Mr. Abel has some information for us this time that we all need and his talk will be very interesting and profitable.

Mr. Thode, of Philadelphia, Pa., will give us a talk on copying old photographs. This should interest every member as there has come a big change in the minds of the general public as regards the copying of old pictures and even the enlarging of small pictures, as the public are now depending more on the local photographer and expect better results from him. They are not satisfied with the ordinary solicitor's work and therefore this business is waiting for you, so you want to learn to do it the very best way that will command a good price. Mr. Thode is an expert at this work and his talk and demonstration will be one you cannot miss.

Portrait Demonstration for the Public

A new feature of this year's program will be a talk and demonstration of portraiture to which the public will be invited, the object being to demonstrate to the public that there is considerable more to portrait making than the mere pressing of the bulb, and the intention being to create more appreciation of good photography and give full credit to the really earnest workers and incidentally give good cause for the charges for good portraiture.

We will have two demonstrations for the public, one for Portraits of Men, by Pirie

MacDonald of New York, and a demonstration of Women's Portraiture, by Will H. Towles, of Washington, D. C. This should prove very beneficial from a business standpoint. We will use the Associated Press for the spreading of the news as the day of this demonstration will be known as Society Day for the Atlantic City people. We will make all the capital we can out of it as a general boost for the photograph business all over the country. This means it will help every photographer indirectly.

J. B. SCHRIEVER, President,
Scranton, Penna.

The Progress of Photography, 1916–1919[1]

By C. E. KENNETH MEES, D.Sc.

THE progress of photography during the period covered by this report has, like all other mundane affairs, been conditioned almost entirely by the war. The war influenced photographic work in many directions, the most striking and important being the application of the camera as a weapon in the hands of the aviators. With the development of trench warfare it became evident that the effective utilization of artillery would depend upon photographic reconnoissance, and the armies developed the use of photography from the airplane for this purpose with great rapidity, so that, by 1917, there were frequent references in dispatches to the numbers of negatives which the aërial photographers had taken; in 1918 one of the Allied armies alone took more than a million negatives and made over six million prints.

With the entrance of the United States into the war, the energies of all concerned with photography in this country were at once devoted to the equipping of the photographic division of the army. Our allies brought us models of the cameras which they were using, and these were modified to make them satisfactory for American manufacturing conditions and copying in quantity. At the same time, experimental work was pushed forward in this country, and new types of cameras were designed which, by the time the armistice was signed, were being produced in large quantities. At the outset the stock of lenses available was not sufficient for the army and navy, the lenses required for airplane photography being of long focus and large aperture. The need was met by the ready response of the photographers of this country to the request that they should turn over their lenses, and a sufficient supply was obtained to fill the gap until American-made lenses could be produced in sufficient quantity. In the end, lenses of great size and of excellent quality were produced in this country, and had the war continued there is every reason to believe that the United States would have been in a position to supply lenses, not only for its own army, but for those of its allies.

The response of the photographers to the demand for men was no less prompt than to the request that they should surrender their treasured lenses, and the photographic division of the army was recruited very largely from the ranks of the professional photographers, about 50 per cent. of the men passing through the School of Aërial Photography at Rochester having had previous experience in a studio. Of the work done by these men in France there is no need to speak. They took part in all the work of the American army and carried out their work as might have been expected of them.

In another branch of the military service, besides that usually associated with photography, an immense amount of photographic work was performed. I refer to the medical service, in which x-ray photography played a most important part at the front. The use of x-ray photography in the war, indeed, has greatly stimulated the use of x-ray apparatus and materials, new portable apparatus being developed which makes it possible to use the x-rays in hospitals with a far simpler and less cumbersome apparatus than that which was used previously for the war. We may expect to see x-rays used far more in the future, both in the medical and dental practice, and also in the industrial arts, since x-rays are now being used very largely for the examination of metals in order to detect flaws and in order to study the structure of joints. It is not my purpose to dwell on the scientific application of x-ray photography; it is enough to mention in passing that the examination of crystalline substances by the x-rays bids fair to be the most important step in the advancement of modern science.

Just as the war led to the development of new methods of x-ray photography, so the experience in aërial photography has led to surveying by photography, and it is to be expected that this will form an important field of photographic work in the future.

Indirectly, the war made it necessary for the manufacturers of photographic materials to devote a great deal of attention to the producton of the raw materials from which photographic goods are made. Through the cutting off of foreign papers and gelatin a great development of home industry in these became necessary, with the result that this country is now self-supporting in these important requisites, and we may expect that the study of the raw paper and gelatin by the photographic manufacturers who are utilizing them will result in considerable improvements in their methods of production and in the product. In the same way the dye industry in this country has been greatly stimulated, so that a great many of the dyes which were imported are now available here, and developing agents which formerly were largely imported are now manufactured in the United States in growing quantities.

Turning to general progress in the photographic field, I may mention the developments which have occurred in photographic theory, though I am aware that this subject is not likely to be of great interest to the practical man since the application of photographic theory to practical photography is generally remote. The laboratories which are working on photographic theory are now studying very carefully the subject of tone reproduction; that is, the way in which the scale of lights and shadows of the original subject is translated into the print, the scale receiving certain modifications as it is reproduced, first in the negative and then in the printing process. Closely connected with this subject is the study of the color of negatives and the effect of the color produced in negatives developed in pyro and similar developers upon the reproduction. An important step in the theory of lens optics was made when Twyman applied the interferometer to the study of photographic lenses, an instrument which enables certain analyses to be made of the image-forming properties of lenses which could not be performed without its aid.

---

[1] A paper read at the Convention of the P. A. of A., Cedar Point, Ohio, 1919.

In motion-picture photography there has been a continuous improvement in photographic quality until today most pictures produced by the larger firms are marvels of photographic skill, the lighting and composition being studied with the greatest care, and all technical qualities in the photography being beyond reproach. Far more of the film is being tinted and toned than used to be the case, and the choice of coloring methods is now of the utmost importance in the finishing of motion pictures. During the last year there have been introduced continuous machines for the printing and finishing of motion-picture positives which may eventually supplant the older methods of handling the stock. The progress of this will be observed with interest by all those concerned with the subject.

In color cinematography the tendency is distinctly toward the use of subtractive processes in the place of additive processes, which have hitherto held the field, and a number of firms are working along processes employing the super-position of complementary pictures which by their unison give a satisfactory suggestion of the original. Color cinematography is, however, still in its infancy; no developments of importance have occurred in stationary color photography during the period covered by this report.

In amateur photography the most outstanding fact is the increase in the importance of the work of the amateur finishing firms, who are now employing considerably more advanced technical methods with improved apparatus, so that it is evident that the finishing of amateurs' pictures will be an even more important branch in the future than has been the case in the past.

All branches of professional photography have been flourishing. In spite of the loss of men to the war, professional photographers have been able to continue their important work and have never been so busy as during the war period.

Work in home portraiture is extending, and there is an increasing use of film by professional photographers in the place of plates. In Great Britain, and in a few places in this country, there have been introduced what are known as "moving" portraits, in which two or three portraits are printed by means of a screen upon one sheet of paper, the screen being moved sideways so that they come into view successively, giving the impression of a portrait that moves. This does not seem to have any artistic possibility and is interesting only as a novelty to attract attention.

The great development of commercial photography is continuing. In all directions photography is being applied for the preparation of catalogues and illustrations, and it is more and more being used in the industries themselves both for recording the progress of work and for studying the product. This line of work is developing very rapidly, and is one which professional photographers are peculiarly fitted by their training and experience to undertake.

There is no doubt that the future is bright for photography. Owing to the important part which photography played in the war, increased interest in its usefulness has been aroused all over the world, and this will stimulate the study and practice of all its many applications. The great number of those who, while in the army, were brought into contact with the practice of photography, has further extended the ranks of its serious workers, so that we may look forward to a greatly increased use of its processes and methods in the world's work from this time forward.

Marketing Photographs for Advertisers

The latest issue (No. 177) of the popular *Photo-Miniature* series is one of timely and vital interest to all photographers who are developing side-lines. This hand-book is a thoroughly practical guide to this profitable field of work. It not only clearly points out the requirements but tells how to reach the market. It is worth many times the price (forty cents) and can be had of all dealers.

The Inventor of "Self-toning" Papers

To the Editor PHOTOGRAPHIC JOURNAL OF AMERICA:

I have seen lately some notices of "self-toning" papers. I legitimately claim the credit of the invention of that process. The *British Journal of Photography* fully acknowledged my claims some years ago. I invented the method as far back as 1869, but gave it no value because it only succeeded on plain paper, when albumen paper was all-important. I published the method in *Wilson's Photographic Mosaics* of 1888, under the caption of "Some Uses of Chloride of Gold."

This publication stopped a suit on account of infringement of some patent taken out about two years thereafter. Of course the same principle is used in emulsions, though my experiments were usually on plain or albumenized papers. I never succeeded with albumen papers.

There is no doubt about my invention, nor that the Wilson publications were the first ones to make it public.—DAVID BACHRACH.

Fifty Thousand Photographs per Second!

A REUTER report from Paris to the effect that two French experimenters, MM. Abrahams and Bloch, had devised an apparatus for taking photographs at the rate of 50,000 per second (according to other reports, 500) has aroused some interesting versions in the lay press, from which it appears that the system consists in the use of a continuously moving sensitive film and a rapidly intermittent service of light such as an electric spark. The technical aspect of the invention was well discussed with the London correspondent of the *Manchester Guardian*, by Mr. S. J. Cox, who is the joint inventor with Mr. H. Workman of the Cinephrome (Ltd.) Camera. Mr. Cox pointed out that the achievement was really a development of an apparatus invented by M. Lucien Bull, of Paris, in 1904. He did not doubt the statement that 500 photographs could be taken in a second, but for practical purposes the invention had very important limitations. There were two methods of taking high-speed photographs. Under the spark system the film was moving continuously and the illuminating point was intermittent, while the reverse was the case in connection with the method under which they had been working in London, for the film moved intermittently and the light was continuous, enabling about 250 photographs to be taken in a second. A disadvantage of the spark method was that the photographs were limited to a very small surface, such as a fly crossing a 4- or 6-inch circle, because the only source of illumination was from an electric spark thrown through a condenser, the object photographed being between the condenser and the camera.

Another important disadvantage was that the object to be photographed would have to be taken to the laboratory. Where the film moved intermittently the camera can be taken out into the open, and the object to be photographed is in the whole field of vision in exactly the same manner as an ordinary cinema. By this method eleven pictures had been obtained of the firing of a howitzer between the explosion of the fuse and the shell leaving the muzzle. In addition they had taken 160 to 200 pictures of a single complete step of a man walking at the rate of four miles an hour.

Very useful photographs have also been taken of surgical operations, especially in cases where the surgeon has been compelled to move so quickly that the actual operation was barely visible to the students gathering round.

On the other hand, a usefulness for the "spark" method could be found in taking small objects, such as bullets or insects, when the exposure would have to be something like a hundred-thousandth part of a second. The bullet could then be shown in its flight.

From the medical point of view, he added, the spark method cannot mean a revolution in experimental science, because, so far as he was aware, the resources of the cameras already existing had not been taxed. Unless there was something not disclosed at the tests he did not think that the new system would mean anything like a revolution in connection with such experiments.

The Eastman Professional School

The school has been reënlisted. It has not been mustered into service as yet, but is so soon to be that it is none too soon for those within reach of the first few towns on its route to make their plans to attend.

It has been two years since the wartime conservation of transportation facilities made it advisable to temporarily discontinue the school.

Photography has made great strides in those two years and a greater and more favorable sentiment toward portrait photography has been created. Photographing the individuals that made up our army and navy was a big order for the photographers of the country. It made business, but it was also responsible for the favorable sentiment we speak of, which means continued business.

Now is the time to show what wonderfully good photographs can be made, and to convince the public that every family should have its picture history; also to exploit photography in the great fields of industry, where it is especially useful, but where only the surface opportunities have been scratched.

The purpose of the Eastman Professional School is not only to teach methods of making better pictures, but methods of getting business and conducting a business profitably, as well. The latter is just as important as the former, and taken together they spell success.

The new school will have, except for its management, an entirely new personnel of instructors, who have been chosen, each, for his special ability to do some one line of work and do it well. They will have a great many new ideas and the ability to express them clearly to others.

Great advances have been made in portrait photography and new methods of portrait lighting will be one of the school features. The very general use of portrait film has enabled photographers to get out of the beaten paths—to produce original but wonderfully natural effects that are startling to those who have known only plate results. It is a relief to break away from the old methods of working and to produce things that are really new. And these school demonstrations of lighting and negative-making will be stimulating.

Industrial photography is another important branch of present-day photography. The term, "Industrial Photography" is a broader one than "Commercial Photography" and is better suited to the work the so-called commercial photographer is called upon to do. A competent instructor is in charge of this work and will offer much information and suggestion and will demonstrate the most approved methods of photographing difficult subjects to the best advantage.

Printing, enlarging, reducing—every step of the various processes of reproduction—will also be treated from every angle, with the aim of producing the best results by the most simple and efficient methods.

And not least, by any means, will be the attention that will be given to business methods. The best photographer is not always the most successful, but he should be, and can be, if he masters business or has a business manager.

If we were asked what things were most essential to success in photography, we would place business ability first. Any able business man with a knowledge of salesmanship, advertising and accounting, who is also a fair judge of human nature, need not know anything about photography to operate a studio successfully. He can employ those who are expert in photographic work more easily than the expert photographer can employ a man with business ability.

The photographer must become a business man. He must manage his affairs in a business-like way to be financially successful, and the sooner he gives business methods a share of attention equal to that which he gives photography the sooner will he profit. The new school will devote several lectures to business methods, and throughout its entire course the business side of photography will constantly be kept in mind.

There will be a lot of work crowded into a three-day session, and to make every point of every lecture perfectly clear the talks and demonstrations will be illustrated.

There will be new features which we cannot mention at this time. We can say that they will be decidedly worth while, however. In fact, the entire school will be so new that no one who can spare the time can afford to miss it.

Photographic Materials and Processes

Photometry of visible light-rays by means of light-sensitive leuco-bases of organic dyestuffs, also by silver chloride and chromate papers. J. M. Eder. Phot. Korr,. 1919, 56, 140–141; Chem. Zentr., 1919, 90, iv, 396.

The leuco-bases of brilliant green, Malachite green, crystal violet, rhodamine B, 3 B, and 6 G, also leucaniline and "leuco blue," are sensitive to the respective complementary colors of the dyes and may be used for actinometric purposes. Mixed with collodion they are more light-sensitive than the dyed silver bromide and silver chloride films hitherto used in photometry. They are also sensitive to ultra-violet. The leuco-base of brilliant green is specially suited for use in plant physiology experiments, being sensitive to that part of the spectrum which is active in chlorophyll formation. A new kind of photometer paper, prepared with potassium chromate and ammonium oxalate, is recommended for blue light.

Blackness of colored bodies and its influence in photography. A. von Hübl. Phot. Korr., 1919, 56, 71–74. Chem. Zentr., 1919, 90, iv, 434–435.

Bodies of pure color are very few; almost always there is also present a certain amount of white light and a more or less considerable amount of general absorption or blackness. The composition of a number of colors in color, white, and black was determined with the aid of previously described apparatus (Phot. Korr., 55, 40). Figures given for colors of exceptional, purity and brightness, specially selected for photographic purposes, show a range of 2 per cent. to 7 per cent. in white, and 0 per cent. to 78 per cent. in black; the only low percentage in black was in a yellow pigment, which had 96 per cent. color, 4 per cent. white, and no black.

Color-photography by the multicolor process of Dufay. P. Pooth. Technik und Ind., 1919, 143–145. Chem. Zentr., 1919, 90, iv, 340.

In Dufzy's process of producing a multicolor screen a colorless film of celluloid is impressed with a series of fine, parallel, square-cut grooves by pressure against a warm engraved roller. The grooves are filled with a greasy ink, all excess removed, and the upper parts of the celluloid surface then stained with an alcoholic dye solution. Both sides of the film can be treated, a four-color screen being thus obtained; the colors in such a screen might be red and blue on one side and yellow and violet on the other.

Chromium intensification of [photographic] silver images; New method for——by the use of chlorochromates. A. and L. Lumière and A. Seyewetz. Bull. Soc. Franç. Phot., 1919, 6, 245–250.

Alkali chloro-chromates are produced by evaporating to crystallization concentrated solutions of the corresponding bichromate with the calculated quantity of hydrochloric acid:

$$M_2Cr_2O_7+2HCl=2MO.CrO_2Cl+H_2O.$$

The potassium salt crystallizes readily in orange-red needles; the sodium salt is hygroscopic and difficult to crystallize; the ammonium salt is more soluble than the potassium salt and crystallizes in orange-red scales. Any of these salts can be used for intensification in place of the usual hydrochloric acid-bichromate formula previously described by other workers; a 3 per cent. solution is suitable for use with plates and a 2 per cent. solution with papers, the treatment in this bath being followed, after washing, by treatment with a strong developing agent. A repetition of the intensifying process increases the amount of intensification, an approximate maximum being reached in six treatments. In these successive treatments the total quantity of silver in the image remains practically constant, while the proportion of chromium increases; the ratio of chromium to silver, was, in one experiment, after two intensifications 33·3:66·6, and after six intensifications 58·5:41·5. It is suggested that the action of the chlorochromate on the image is expressed by the equation

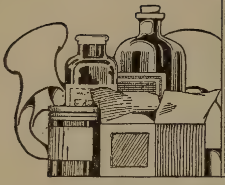
$$2Ag+MCrO_3Cl=AgCrO_3Cl+AgCl;$$

the silver chloride being then reduced by the developer to silver, each intensification thus reducing the metallic silver in the image by one-half.

The WORKROOM

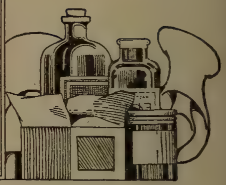
CONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

A Modified Bleacher in Chromium Intensification
Gravure Bromide
Determining the Acidity or Alkalinity of Gelatin and Gelatin Emulsions
Cellulose Ester Cum Colloid Two-Color Screen Films
Developing Customers' Prints
Hypersensitizing Commercial Panchromatic Plates
Reducing-out Backgrounds
Finishing Blocked-out Negatives
A Printing-box Dodge
A Lens-cleaning Hint
Clean Trays Mean Better Prints
Radiographs Direct on Bromide Paper
Gas Leakage from Flexible Metallic Tubes
Photographing on Canvas
Winter Troubles and Winter Precautions
Some Points in Copying—II
Double Fixation of Prints
Formulas for Reducers
Permanence of Kallitype Prints
The Time-saving Tank
The Saving of Residues
Patent News



THE WORKROOM

By the Head Operator



A Modified Bleacher in Chromium Intensification

THE revival of interest in the "chromium" intensification process evinced by the recent publication in this journal[1] of the preliminary results of a research by MM. Lumière and Seyewetz will be welcomed by those who employ this excellent process. To those who value the quality of permanence, which characterizes the chromium intensified image, it is not a little surprising that this process has not completely replaced the many which make use of mercury compounds. The further advantage of being able by a slight modification to use the process for the reduction of excessive contrast in a negative[2] does not seem to have much weight with the average photographer—a truly conservative individual—to whom the only change which is worth serious consideration is one which "makes things easier." It may be safely predicted, therefore, that the chromium intensification process will become the popular process when it is less trouble to work than any other.

Before ideal simplification can be attained, however, much spade work in the form of research has to be carried on, work which adds to the sum of knowledge in other branches of science as well as that with which it is more directly concerned. For example, MM. Lumière and Seyewetz have advanced a tentative theory to account for the operation of the substances used in the process under consideration; should they be able to bring forward sufficient evidence to substantiate their assumptions, fresh light will be thrown on the constitution of chromites and a valuable addition to our knowledge of the chemistry of chromium will have been made.

One of the considerations on which their theory has been enunciated is the fact that chlorochromates are efficient bleachers in this process, whereas no bleaching takes place if the reddish-brown crystals obtained by acting on a bichromate with *hydrobromic* acid are used. Theoretical considerations would lead one to anticipate such results, for no bromine compounds analogous to the chlorochromates have been prepared. Nevertheless, hydrobromic acid will efficiently replace hydrochloric acid in the bleaching bath. A negative treated with the following solution:

Potassium bichromate . . .	5 gr.
Hydrobromic acid (25 per cent.)	5 min.
Water	1 fl. oz.

is effectively bleached, and if after removal of the bichromate stain by washing, the bleached image is developed in the ordinary way a black, strongly intensified image results.

The following points in this modified process are perhaps worthy of mention:

(*a*) The bleaching is quite as rapid as that of a bath containing an equivalent amount of hydrochloric acid—in fact, it appears to be somewhat more rapid, but the difference in speed observed may be ascribed to difference in the physical condition of any two negatives rather than to any specific difference in the bleaching bath.

(*b*) The buff color of the bleached image is more pronounced when hydrobromic acid is used than when an equivalent of hydrochloric acid is employed.

(*c*) The amount of intensification appears to be greater in the case of the hydrobromic acid bleaching bath, but the difference in this respect between the two acids is not perhaps sufficient to justify the use of the more expensive hydrobromic acid.

Now, while this modification of the chromium intensification process is perhaps of little practical importance, it is worthy of some attention from the point of view of theory, for it indicates that although a solution of a chlorochromate may be used for intensification purposes, it is not necessary to assume that the chlorochromate *per se* is the active agent, as was suggested by Piper and Carnegie.[1] The following alternative theory of the bleaching action is supported by results obtained by the writer, a note of which has been published elsewhere.[2]

It is generally assumed that when hydrochloric acid is added in relatively small amounts to aqueous solutions of bichromates an equilibrium is set up by virtue of which chlorine in the nascent condition is obtained. This chlorine may be brought into the ordinary or gaseous condition by the simple expedient of boiling the mixed solutions, when something like the following reaction occurs:

$$K_2Cr_2O_7 + 14\,HCl = Cr_2Cl_6 + 2\,KCl + 7H_2O + 3Cl_2.$$

If, however, instead of removing the chlorine by heat, metallic silver be placed in contact with the solutions, the chlorine is removed thereby, and at the same time a chromic salt is produced. When the solution is of the strength which is used in intensification the amount of hydrochloric acid is insufficient for the formation of a normal chromic salt, consequently a hydrated or basic insoluble salt is formed in the film contiguous to or surrounding the silver chloride.[3]

---

[1] B. J., 1919, p. 451.

[2] Ibid., p. 465.

---

[1] Amateur Photographer, 1904, xl, p. 399.

[2] Journal Soc. Chem. Ind., 1916, xxxv, p. 817.

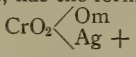
[3] Piper and Carnegie have observed that silver in contact with a solution of chromic chloride is attacked and converted into the chloride with simultaneous formation of a basic chromic salt.

An objection to this conception might be urged that, whereas the bleached image is of a brownish hue, the fullness of color being roughly inversely proportional to the concentration of hydrochloric acid present in the bleaching bath, buff colored hydrated chromic salts are unknown.

There is no doubt whatever that the buff color of the bleached image is not contributed by the chromic salt. The writer's experiments already referred to, which were conducted on silver mirrors, and in which analyses of the bath and the "bleached" film were made, clearly demonstrated that chromic acid, CrO_3, disappeared from the bath and was present *as such* in the "bleached" film. For reasons which, although affording definite evidence on the point, need not be gone into in the present communication, it may be assumed as highly probable that the basic chromic salt absorbs chromic acid, and that the buff color of the bleached image is due to this absorbed component. Bothamley,[1] while apparently unaware of the writer's experiments, has offered a similar explanation, but his conclusions are somewhat discounted by the fact that the buff color is attributed to the presence of chromic chromate—a compound the existence and constitution of which are still subjects of controversy.

Confirmatory evidence of this absorption phenomenon has since been obtained by the author in a large scale operation in which an oxidation with a bichromate is conducted in a gradually increasing concentration of sulphuric acid. In this case, until the concentration of the sulphuric acid reached a definite minimum, the oxidized insoluble product was contaminated with absorbed chromic acid, which latter was present in decreasing amounts as the mineral acid content of the oxidizing solution increased in concentration above the minimum.

These considerations apart, the theory advanced by MM. Lumière and Seyewetz is somewhat discredited by the constitutional formulæ which are given in support of it. The compound referred to as a double chromite, and which is assumed to exist as such in contact with a bichromate, has the formula



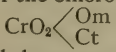
$$\mathrm{CrO_2}\begin{array}{l}\diagup\mathrm{Om}\\ \diagdown\mathrm{Ag}\ +\end{array}$$

ascribed to it.

Two objections to this formula may be cited:

(*a*) Chromites are generally assumed to be constituted according to the general formula CrO.OM, and no amount of rearrangement will enable MM. Lumière and Seyewetz's formula to be so written.

(*b*) The electro-positive element silver (Ag +) has deported itself as an electro-negative element having replaced the electro-negative element chlorine (Cl −) of the chlorochromate.



$$\mathrm{CrO_2}\begin{array}{l}\diagup\mathrm{Om}\\ \diagdown\mathrm{Ct}\end{array}$$

While such dual deportment is well known as a characteristic of many of the elements, there is no known instance of silver so behaving. These are the days, however, of the rough handling of generally accepted theories, and until further work has been done on the question it would be unwise to affirm that the constitution ascribed by MM. Lumière and Seyewetz to the chromium element of the bleached image is an impossible one.

Nevertheless, the efficacy of hydrobromic acid in conjunction with bichromate may legitimately be regarded, in the writer's opinion, as confirmatory evidence of the views herein reiterated; for just as the usual bleaching bath may be regarded as a solution containing nascent chlorine, so may a bath made up with hydrobromic acid be regarded as a solution of nascent bromide. This nascent bromine by attacking the silver of the image or mirror, as the case may be, and converting it into silver bromide, is removed from the sphere of action and the reduction of the bichromate to a basic chromic salt becomes a static condition, with ensuing adsorption of chromic acid. The subsequent action of the developer simultaneously reduces the silver bromide to silver and the chromic acid to hydrated chromic oxide, or more probably to chromic hydroxide.

Further experiment should readily decide between the two theories, for the amount of developer consumed in the final development will be appreciably greater for a given amount of original silver in the case of the bleached image being an absorption complex than if the chromium be present in the image in such combination as suggested by MM. Lumière and Seyewetz.

The writer hopes at an early date to be able to continue his experiments the results of which, when taken in conjunction with those of other workers on the subject, may possibly afford positive evidence on the constitution of the compound known as chromic chromate, and should certainly allow of a clearer understanding of the reactions which occur in the chromium intensification process.—Raymond E. Crowther, in *B. J.*

Gravure Bromide: A Simple Method of Producing Toned Bromide Prints with a Gravure or Carbon Finish

The present article deals with a modification of the copper ferrocyanide process of gum printing on bromide. In a previous article the process was treated, primarily, as a method of pictorial control. With the alterations in detail which I am about to describe it becomes purely automatic; and, with the exception of the coating of the bromide print, calls for manipulative skill in no way different from the processes of development and toning.

In order to obtain a gravure effect, the bromide print should be on a fine rought matt or platino-matt paper. The gum is easy to spread on such a paper, and, moreover, does not show any tendency to flake off during development as it may do from a glazed surface. The print must be free from fog or veil, with strong shadow detail, and good gradation in the high-lights. A clean, bright, moderately strong print will give the best results.

The print must first be allowed to dry, then dipped in water for a moment to make it lie flat, wiped with a cloth both back and front, and coated as thinly and evenly as possible with a mixture of gum and pigment prepared as follows: Take 7 grains of culinary sheet gelatin (cut in shreds) and 18 grains of gum arabic (crushed) and place with 6 drams of water in a covered jar. Allow to soak an hour or two and then heat in a water-bath until the solution is complete. Then add 26 grains of white dextrine and 13 grains of sugar to the hot mixture and stir until these also are dissolved. With this quantity of mixed colloids is to be incorporated not more than 5 grains of vandyke brown, or 6 grains of Winsor and Newton's bone brown. The mixture does not keep and should be used within three days. Coating is done with the warm mixture, which must be stirred up before use. About one teaspoonful is sufficient for an 11 x 9 in. print, and this is spread as quickly as possible with a flat camel hair or soft hog hair brush.

---

[1] Photographic Journal, 1918, No. 2, p. 53.

The coated print must be allowed to dry before treating it with the copper solution, which is prepared at the time of using from two stock solutions as follows:

Stock Solution A

Copper sulphate	4 gr.
Sodium or potassium citrate . .	16 gr.
Water	2 oz.

Stock Solution B

Potassium ferricyanide . .	8 gr.
Potassium bromide . . .	4 gr.
Water	2 oz.

For use, 2 drams of A, 2 drams of B, and 6 drams of water are taken, and this quantity is sufficient for a 10 x 8 in. print. Fresh solution must be made for each print and allowed to act for a definite time—two to three minutes is what I have found correct. The prints may be dipped in cold water for a few seconds in order to make them lie flat before flooding with the copper solution. The print is then rinsed, and care must be taken not to allow water to fall directly on its surface. For this reason, throughout all operations, it is necessary to use dishes which are larger in area than the print itself: and any solution added must be poured in at the side of the dish away from the print.

The print is next placed in a dish with about a breakfast-cupful of lukewarm water (about 80° F.). After a few seconds the water is poured back into the cup and its temperature increased by adding about one-fourth its volume of hotter water, and this is repeated until the pigment leaves the high-lights, which should appear like clean white paper. Development is then stopped and the print is hung up to dry.

It may be pointed out here that the unexposed margins of the bromide print, which will have been coated with pigment, afford a ready means of finding the correct temperature; as, when the pigment leaves these, it will also leave the high-lights, provided these are acted upon by water of the same temperature. The print, at this stage, will look rather heavy, the high-lights chalky and the color purple. It is better to dry it at this point; because the pigment coating will in that way be rendered less delicate and able to resist rougher treatment during subsequent operations.

The dry print is soaked for a few seconds in cold water and treated for one minute with about 2 ounces of water containing 1 grain of caustic soda to the ounce, which solution will serve for several prints in succession. The print is washed in three or four changes, and then treated with two successive baths of dilute hydrochloric acid containing 10 minims of strong acid to the ounce of water. The first acid bath may be used for several prints in succession, as long as it remains acid; the second should consist of an ounce or two of fresh solution. Another rinse in a few changes of water and the print is ready for bleaching and sulphiding, which operations are conducted as with an ordinary bromide print. If sodium sulphide is used, it must, however, be in dilute form owing to its alkalinity. If barium sulphide is used, there is no risk of softening the pigment, but the barium should first be precipitated with Glauber's salt. With dilute sulphide solutions, it is always advisable to pass the print through two baths—the latter fresh, in order to make sure the action is complete.

When dry, the print should be of a good color, with a very fine granularity of surface. It should be strong and bright, and the high-lights, being entirely clear of gum, will show good relief.

A carbon effect is obtained by varnishing. I have found a weak dammar varnish suitable, containing about 10 grains of dammar dissolved in 1 dram of turpentine and the quantity made up to ½ ounce or 1 ounce with petrol or benzine. A stronger sheen is obtained by means of a varnish composed of gum dammar dissolved in benzole without the addition of any turpentine. Either of these may be applied with a tuft of cotton.

The process as just described is a very cheap one, very certain in its results, and yields prints of uniformly first-rate quality, provided, of course, the original bromide prints were correctly exposed and developed, and are made from good negatives.—T. H. Greenall, in *Amateur Photographer*.

Determining the Acidity or Alkalinity of Gelatin and Gelatin Emulsions

By R. Bruce Archey

Several methods have been devised for determining the acidity or alkalinity of gelatin for emulsions, but none of these methods have been successful for determining the normality of a gelatin emulsion in acid or alkali, since the molten emulsion interferes with the color reaction in the case of solution and the gelatin itself is subject to decomposition in the case of steam distillations, which would not liberate non-volatile acids.

The following method has been found quite satisfactory by the writer and is based on the principles as used in the emulsifying and developing processes. It may be considered as a process of dialysis of an electrolytic solution as standard acid or standard alkali which disassociate as $H_2^+ + SO_4^{--}$ and $K^+ + OH^-$ which dialyzes through the collodial gelatin body, establishing an equilibrium between the acids or alkalies contained in the gelatin and the dialyzing media, thereby forming the characteristic alkaline salt of phenolpthalein or reverting it to its acid condition.

If the method is to be used for gelatin determinations, the gelatin is made up in a standard-strength solution and set in ice-water. The solidified gelatin or emulsion is then broken up into fine, uniform shreds by means of a hand-press, and sixteen or more samples of 10 grams each are accurately weighed out and each one transferred to a separate beaker. To each beaker add 100 cc. of neutral distilled water and 1 cc. of a 1 per cent. alcoholic solution of phenolphthalein at 10° C. Then to the beakers add from first to last 0–1–2–3–4–5–6–7–8–9–10–11–12–13–14–15 cc. of $\frac{N}{5}$ KOH and allow to stand in a tank of cold water at 10° C. for twenty-four hours or until dialysis is complete. The beaker that has just turned in color is taken as the end-point and from this the acidity per liter of gelatin solution or emulsion may be calculated, in terms of cc. of normal solutions of standard acid. For determining the alkalinity $\frac{N}{5}$ sulphuric acid is used instead of ^{N} potassium hydroxide.

The same method can be applied to coated emulsions if the quantity of air-dried emulsion per unit area is first determined.

It is quite necessary to keep the gelatin and the water cold, thereby preventing the decomposition of the gelatin with the formation of amino-acids, which, while neutral to indicators, will cause contradictory results.

Cellulose Ester Cum Colloid Two-Color Screen Films[1]

The means by which a color-screen base can be produced is, in general terms, as follows:

(*a*) A surface of cellulose ester, or salt, as nitrate or acetate of cellulose, is coated with small distributed areas of a fluid aqueous colloid preparation containing a transparent color.

(*b*) The colloid areas if not already insoluble in cold water are, when necessary or when an aqueous fluid is to be brought into contact therewith, insolubilized to water and the whole is thoroughly dried.

(*c*) The surface is treated for a short time with a solution of a color approximately complementary or anti-chromatic to the tint or color of the colloid preparation, the solvent being one which softens the cellulose ester but not the water-soluble colloid, which now forms a resist.

(*d*) Excess color is blotted off or otherwise removed. Operations *c* and *d* may be repeated to obtain a right intensity of color.

(*e*) The surface is treated with an appropriate fluid to remove traces of the second color which adhere mechanically to the surface of the colloid areas; soured or acidulated water being generally appropriate when the solvent of the second color is a fluid base, as aniline, for example.

(*f*) If at this stage either color requires intensification to realize the requisite total general, or average, approximation to neutral tint, an aqueous solution of dye may be applied to color the colloid further, or, alternatively, a stain appropriate to affect the cellulose ester may be applied. In the latter case, operation (*e*) may require to be repeated.

(*g*) The color base, as produced at stage (*f*), will serve, when but two colors are required, the two colors being green and red or near variants. A third color, blue, may now be added by cross ruling, random spraying, printing, or otherwise; this third color being arranged to take or bite on one or both of the colors previously produced.

(*h*) The composite color screen base may now be covered with a protective waterproof stratum, if required, and is ready for coating with sensitive emulsion. To isolate the coloring more completely from the emulsion the film of cellulose ester which carries the composite color screen system may be stripped from its support and cemented color-face downward on any convenient support, or a thickness of cellulose resist may be built up on the screen as here described.

(*a*) Although ordinary celluloid or acetate celluloid may be used, the presence of additions, as, for example, camphor in indeterminate quantity and quality (degree of purification from the accompanying oil) may disturb operations, so, when practicable, the applicant prefers in the case of the finest screens to use a cellulose ester or a mixture of esters without the addition of camphor or other solid solvent. A somewhat stiff amyl-acetate collodion poured on a levelled glass slab forms a desirable base for operation, and a convenient method of retaining the film of ester on the glass is to lay an edging of india-rubber on the margin of the face of the plate which is to be coated, as by painting an edging on the face of the glass with the official "liquor caoutchouc" or india-rubber solution of the 1898 edition of British Pharmacopœia. Otherwise the whole surface of the glass plate may be rubbered, and in this case the purest benzene without any sulphur compound may be desirable. The stratum of cellulose ester being thus obtained and conveniently supported on a level and rigid support of glass, the surface is then plotted out or partly covered as a lined or stippled system, with a colloid material charged with a suitable soluble color, the color being red or reddish when the second color for staining the ester is green or greenish. On the other hand, the color in the colloid mixture may be green or greenish, in which the second color for staining the bare parts of the ester should be red or reddish.

The quality of the pyroxylin used for this purpose is a matter of some importance. The officinal "pyroxylin," prepared according to the official instructions on page 323 of the 1914 edition of the British Pharmacopœia, is quite satisfactory, but most samples of tough or "low temperature" nitro-cottons of commerce, or "surgical" pyroxylins may serve. Perfect solubility and toughness are the leading criteria.

---

[1] Technical details are given in a recent English patent specification, No. 129,717, of Mr. J. T. Smith, of a process of preparing mosaic two-color filter films of a degree of fineness which, it is claimed, is sufficient for the production of color films for cinematograph projection.

Pyroxylin as specified	100 gr.
Amyl acetate	4 fl. oz.

About 100 grains of this collodion or solution may be used as the dose for coating a quarter plate (3½ by 4¼ ins.), this giving a desirable thinness of film when the finest lines or grains are to be formed, whereby obviously lateral penetration or diffusion of the stain under the colloid lines is so minimized as not to injure or darken the color combination by overlap of color.

Colloid Mixture or Ink for Lines or Granulation

Red

Para-rosanilin color-base	12 gr.
Water	240 gr.
Glacial acetic acid	10 gr.

When all is dissolved add:

Fish glue	140 gr.

Excess of acetic acid should be avoided, as also the use of fish glue, which is acid, as acidity of the mixture may cause the aniline solution (or like solution) of green dye to adhere to the lines.

Para-rosanilin color-base (as distinguished from para-rosanilin leuco-base) is regarded by chemists as tri-amino-phenyl-carbinol, and applicant believes that this is the color base of the dye known in commerce as "diamond magenta." To be specially appropriate for use in relation to the invention the para-rosanilin color base should be free from phenyl or alkyl substitution products which give a bluish cast to the color. An ordinary rosanilin base or similar base may be used, but in preparing the color the crimson cast should be preferred. Crimson colors of the nature of magenta are well known to experts in anilin colors.

The fish glue used is the semifluid kind sold commercially as "Le Page's special photo-engraving glue for process work." This is understood to be guaranteed as free from acid.

Green Colloid Solution

"Acid green color" of commerce	10 gr.
Water	55 gr.

Add the following mixture:

Fish glue (as noted above)	40 gr.
Water	50 gr.

Any undue acidity should be avoided, as in the case of the red colloid mixture and all such mixtures. The colloid inks for the purpose of the invention may be colored to suit whatever color combination is selected for the composite color screen, the selection being according to well-known principles. The color must, however, be soluble in water.

Alternatively, the colloid mixture may be uncolored, and after the lines or areas are insolubilized they may be colored by the use of an aqueous solution of dye, as explained below.

(*b*) To insolubilize the fish glue ruling, the ruled plate is by preference exposed to the vapor of formaldehyde, conveniently from an aqueous solution of formaldehyde; another method is to add a soluble chromate to the ruling ink or mixture, and to allow time or light, or both, to bring about insolubility of the dry lines.

Insolubilization of fish glue areas in a vapor bath of formaldehyde has been touched upon, but, if desired, the formaldehyde vapor bath may be used for a supplementary hardening: alternatively a formaldehyde liquid bath may be used for any colloid areas or lines which are not immediately soluble in cold water. For the first stage in insolubilizing the areas of unchromated fish glue, the formaldehyde vapor is of great value, as it in no sense or degree impairs the sharpness or perfection of the marginal parts of the areas.

After insolubilization, and before the next stage (*c*), the gelatinous areas should be thoroughly desiccated, this being conveniently done by slight warmth or by leaving the surface for a time in a cold, drying box containing chloride of calcium.

(*c*) The solvent of the staining fluid should be of such a nature as to penetrate, soften, or incipiently dissolve the bare surface of the cellulose ester, but not so active as to attack or soften the colloid areas in any way, in the sense of making the base so pasty or soft as to bring about removal of the lines or areas of resist material.

Ordinary alcohol, methyl alcohol, and acetone as such, and, while anhydrous, fulfil the above conditions, but as in drying or evaporating these solvents absorb moisture, their use often or generally involves a slight subversive staining of the colloid areas, the aqueous residue drifting over to the colloid resist and staining it.

A solution of anilin color in anilin itself is well known as an ink for writing on celluloid, and is especially suitable, as the surface of the colloid areas is not stained or attacked, provided that the herein stated precautions are observed.

Solutions suitable for the purpose of the invention are as follows:

No. 1

Anilin of the grade sold commercially as "analytical reagent" or A.R.	100 gr.
"Acid green" anilin color	12 gr.

No. 2

Anilin, as above	100 gr.
"Methyl red" anilin color	4 gr.

The plate bearing the stratum of cellulose ester, on which are greenish or reddish lines of colloid, as described, having been well desiccated, is quickly and uniformly brushed, or mopped, or soft-rollered over the green or the red dye dissolved in anilin, the green solution being used if the colloid lines are red, and the red solution being used if the colloid lines are green.

(*d*) After a short interval, three to thirty seconds, for example, the excess is blotted off with a short pad, and, if necessary, other similar applications and blottings off follow. By several short treatments, as contrasted with one prolonged action, the tendency of the dye to penetrate laterally or obliquely under the colloid lines is diminished. The adjustment of the activeness of the solvent in relation to the quality of the base of ester or celluloid is an important aspect of the invention. As above stated, the purer anilin sold as "analytical reagent" is the preferred solution such a case one procedure is first slightly to soften the surface of film consisting of the pure cellulose ester (cellulose nitrate) as deposited from the solution in amyl acetate. This purer anilin is also suitable for many, or perhaps most qualities of commercial celluloid film, but the applicant has met with qualities so resistant to the action of pure anilin as a solvent that endeavors to stain the material with the anilin solutions given above were futile. In such a case one procedure is first slightly to soften the surface of the celluloid with methyl alcohol, amyl acetate or acetone, and then to apply the solution of dye in anilin. Alternatively, the above-mentioned solvents may be mixed with the anilin solution of the dye.

In the case of a quality of celluloid which is extremely resistant to solvents, nitrobenzene may be used in a similar way to increase the solvency of the anilin. In an extreme case the staining dye may be dissolved in the pure nitrobenzene, but in all ordinary cases the solvent or softening powers of such a solution would be excessive.

In the use of nitrobenzene, especially by itself, there may be some care required in selecting a suitable color, but the inventor found malachite green to dissolve readily in a sample of nitrobenzene which he had purified to the utmost. This solution kept well for a few weeks, and instantly stained the hardest celluloid of the applicant's selection.

(*e*) It is now generally expedient to remove the excess of anilin by soaking the plate in weak sulphuric acid for about four minutes; one weight unit of sulphuric acid to from 20 to 100 weight units of water being convenient. The plate is now washed and dried. This treatment in the acid bath also tends to remove any trace of the anilin mixture which may adhere to the surface of the colloid resist. Other rinsings appropriate to the stain and its menstruum may be used.

(*f*) To intensify the colloid areas, an aqueous solution of an anilin dye should be used, and the plate should be thoroughly dry in order that the film of ester may become hard and compact, so as not to take color readily from an aqueous solution. That the pyroxylin or ester should be of the tough kind rather than pulverulent or soft kind is sufficiently indicated above. In intensifying the stain on the cellulose ester surface, care should also be taken that the plate is completely dry. The process of intensification is merely another operation as detailed under the heading. By using a suitable dye, tint (as also intensity) may be modified by the intensification.

(*g*) The instructions so far serve to produce a composite color screen in two colors, the third color, if required, being added afterward, either as an independent blue ruling, lining or spraying, which impartially takes upon both elements of the two-color screen, or, alternatively, the blue color may be made discriminative in the following manner:

Let it be supposed that the green areas are produced in the film of cellulose ester and that the red color is embodied in the colloid areas. If now a solution of anilin blue is anilin, or its technical equivalent, as herein indicated, is ruled or sprayed, and, after blotting off, the plate is treated in the above-mentioned souring bath, the blue color will take only on the green, where it will be especially required, and will not take on the colloid surface charged with red. Alternatively, if the colloid lines are green, an aqueous solution of blue dye, with or without the addition of a water-soluble colloid, may be sprayed or ruled as a scattering over the whole surface, and on rinsing off with water the blue will leave its impress most notably or entirely on the green colloid lines. The tints or colors involved in this kind of discriminative treatment may be varied according to the requirements of the color scheme.

When the blue is to cross the green, or partly cover the green, an original green of a yellower tint is indicated than when the green is to form part of a two-color system; on the other hand, when the greenish color of the two-color system is a greenish blue (alternatively a bluish green), the third color applied in any of the above modes (discriminative or general) may be yellow instead of blue, as specified. In this case the yellow over the greenish-blue gives green by abstraction or obstruction, leaving the uncovered portions of the greenish blue to form another element of the combination.

(*h*) An especially expedient course when flexible surfaces or "films" are required for exposure in the camera is to strip the composite color screen as prepared on a glass support and to mount the stripped composite color screen ester side upward, on ordinary celluloid, this giving an inert or non-active side for coating with the sensitive emulsion. For this purpose the receiving surface of celluloid should be made slightly adhesive as by a thin coating of amyl acetate collodion, and the stripped composite color screen is pressed, color side downward, into close contact and adhesion. In this operation the least practicable quantity of adhesive should be used, so as to minimize any inter-diffusion or overlap of color. Heat may be employed with the pressure, or alternatively heat and pressure may be employed without any adhesive. Instead of applying adhesive as such, the celluloid or ester surface may be moistened or fumed with a solvent, as, for example, amyl acetate.

Successive thin coatings of celluloid varnish or cellulose ester varnish, prepared, for example, with amyl acetate as a solvent as hereinbefore specified, may now be applied, thorough drying being effected between the applications. Thus is built up any required thickness of inert protective material between the composite color screen and the emulsion, or the composite color screen and any chemical used in after-treatment. The reason for using successive thin coatings is to prevent such softening of the whole mass as may lead to subversive inter-diffusion of the colors, and, if desirable, a thin stratum of india-rubber or resinous material may be used between any two coatings. The operation of transfer makes it practicable to thicken the back or the front of the original film of cellulose ester, but when no transfer is made the india-rubber substratum may conveniently cover the whole surface of the glass plate instead of being confined to the edges.

Although anilin is mentioned as a desirable solvent for such color as is used to stain the cellulose ester, other solvents may be used, the whole range of what may be vaguely termed alcoholic, etherial or aromatic solvents being more or less available, and the solvent must be selected in reference to the coloring body used. Preference is, however, given to basic solvents which are physically and chemically comparable to anilin, removal in an acid bath being easy; and in this connection may be mentioned the liquid toluidines (orthotoluidine and meta-toluidine), whether alone or with anilin.

It should be understood that the composite color-screen produced as herein described, by interdependent coloring and staining in stages, may be formed on ordinary thin celluloid or on similar sheets of cellulose ester without camphor, either after manufacture or while the celluloid is with or on the moulding plate or moulding wheel, and emulsion may be laid on either side of the stripped sheet as may be expedient.

In all heliochromic processes it may be expedient to introduce a neutral key element to conduce to critical sharpness and also intensity. One way in which a neutral key can be associated with results by the present process is to superimpose a weak monochrome taken actually from the same standpoint, any suitable or known optical device being used for this purpose. Another mode suited for cinematograph projection is to produce alternately heliochromes, by the herein described process, and monochromes on the same film, a lens of higher or deeper defining power being preferably used for the monochrome alternations. In the final or exhibition film the heliochromes and weak monochromes would be cast on the screen in alternation.—*B. J.*

Developing Customers' Prints

All up-to-date dealers undertake printing from customers' negatives, and it is fairly safe to say that at least 90 per cent. of this printing is done on gaslight paper and developed with metol-hydrokinone.

The reason for the gaslight paper is fairly plain, viz., the peculiar suitability of this paper to abnormal negatives, but the popularity of m-q. is not so easily understood, particularly in winter. In the busy summer, when solutions are naturally at a moderate temperature, m-q. appeals to the printer on account of its keeping qualities, which allow of large stock quantities being made up at infrequent intervals. In the winter, however, there is not the call for such quantities, so this point is not so important, a more significant factor being the susceptibility of hydrokinone to a fall of temperature.

During the cold months negatives are liable to be thinner and flatter than at other times. This calls for a vigorous paper, but a vigorous paper is not going to be of much use with a soft developer, and m-q. is a very soft developer at temperatures too low for the hydrokinone to be active. In effect it is merely a metol developer.

In what little bit of really hot weather we do get the opposite conditions prevail. The sun, which is responsible for the dense bold negatives, is also the cause of the abnormal activity of hydrokinone when it would be better inactive altogether.

This, of course, can be corrected by installing some method of keeping solutions at a constant temperature of 65° to 70° F.

But why use m-q. in the winter, or on very hot days?

The favorite developing agent of the professional is amidol, but his work is mostly on bromide and what he calls "slow-development" papers. Consumers of gaslight paper seem to be prejudiced against amidol, and at least one manufacturer deprecates its use altogether. And yet, as a matter of fact, amidol is for all practical purposes every bit as useful as m-q. The same thing applies to azol, etc.

Amidol has one or two distinct advantages over m-q. The very fact of it having to be made up fresh is really an advantage, for there is no gainsaying the fact that of a fresh solution and one that has been made up for days or weeks, the former inspires the most confidence.

Amidol appears to exhaust more quickly than m-q., but the latter is deceptive and will continue to develop apparently well long after it is capable of producing a good black. Amidol, if forced, will do just as much, but it will show more plainly when its best work is done. Amidol does not readily produce greeny blacks, and although the old aversion to an "olive tinge" is disappearing there is no chance of adverse criticism with pure blacks. Amidol has been accused of causing stains. Any developer will cause stains if handled carelessly. Personally, I have never experienced staining with gaslight papers unless forcing with m-q. This is particularly noticeable with slow lantern plates, which stain more readily than papers do.

A good average amidol formula for gaslight emulsion is:

Sodium sulphite		8 oz.
Potassium bromide . . .		40 gr.
Amidol	4 drams,	30 gr.
Water		80 oz.

This will develop a correctly exposed print in from thirty to sixty seconds at summer temperatures, and from sixty to one hundred and twenty seconds in winter. There will be no unclean prints if sufficient bromide is used and the paper is not stale. This formula can be made to keep by adding 2 ounces of metabisulphite which also slows the action and produces bolder prints. If the amidol is left out until the developer is required for use the metabisulphite can be neutralized by the addition of its own weight of carbonate, for instance a stock solution containing

Sulphite	4 oz.
Metabisulphite	2 oz.

becomes on the addition of

Carbonate	2 oz.

the practical equivalent of a solution containing 8 ounces of sulphite.

To add the carbonate with the amidol already in solution is an uncertain and risky operation.—*Photo-Dealer.*

Hypersensitizing Commercial Panchromatic Plates[1]

ORDINARY dry plates, which owe their sensitivity to the silver halides alone, are sensitive only to the violet and blue regions of the spectrum. If, however, a suitable dyestuff be added the emulsion becomes sensitive to other regions, the particular region depending on the dye used. Thus erythrosin sensitizes to the green and greenish yellow, pinaverdol to the green and yellow, pinacyanol to the orange and red, and dicyanin to the extreme red and infra-red.

The dyestuff is applied to the halides in one of two ways: In the commercial orthochromatic (sensitive to green and yellow) and panchromatic (sensitive to all colors) plates, the dyes are incorporated in the emulsion and the mixture flowed over the glass plate. The second method consists of bathing an ordinary blue-sensitive plate in a dilute solution of the dye and allowing the plate to dry.[2]

The bathed plates are in general faster than the commercial plates,[3] and, of course, have the advantage that the plates can be sensitized for any desired region. Certain dyes, moreover (dicyanin, for example), cannot be successfully incorporated in the emulsion. The bathed plates, however, if not used soon after bathing or if kept at a high temperature, are, in the case of most dyes, more susceptible to chemical fog. Dicyanin and pinacyanol bathed plates when prepared so as to produce the greatest sensitivity are useless after three or four days.

It has long been known that, though at the expense of keeping qualities and freedom from chemical fog, the speed of bathed plates can be increased by the addition of ammonia to the dye-bath. Since this increase is quite marked in the case of some dyes it was hoped that in this way commercial plates could have their speed increased, and at the suggestion of Dr. P. W. Merrill a study was made at the Bureau of Standards of the influence of ammonia on commercial orthochromatic and panchromatic plates.

Since ammonia, when added to the dye-bath in preparing bathed plates, increases the sensitizing action of the dye, its action on commercial plates are investigated.

In the course of the work three methods of sensitometry were used. Of these, one was used as a first qualitative test; the second, the spectrograph method, was used to study the effect of the ammonia on the sensitivity of the plate to each wave-length; the third, the Hurter and Driffield method, gives the absolute value of the speed of the plate.

It was found that by bathing commercial panchromatic plates in a solution of 25 c.c. ethyl-alcohol, 75 c.c. water, and 3 c.c. of strong ammonia water (20 per cent. NH_3), for four minutes at 18° C., and drying rapidly, the speed to white light is increased 100 per cent. in nearly all cases, and the sensitivity in the red extended one hundred or more Angström units. The speed in the red is increased, in many cases, 400 per cent. If the plates be bathed without the alcohol (100 c.c. water, $3\frac{1}{2}$ c.c. ammonia water) the speed is still more increased, but the plates should be used immediately after drying.

Ordinary plates do not have their sensitivity appreciably changed. Most brands of orthochromatic plates are not improved, although one, the Cramer Trichromatic, showed the same increase as the panchromatic plate.

Reducing-out Backgrounds

IN many copies and some commercial subjects it is preferable to remove the detail in the background so as to permit the latter to print black rather than to block out the negative with opaque paint in the usual way. Some years ago I worked out a method of doing this by coating the film side of the negative with collodion and using a very strong iodin solution, applied by means of a brush, as the reducing agent. This was published in the "B. J." and although it was preferable to scraping the film, especially in the case of negatives for enlarging, it was not an ideal method, and the following procedure will be found to be an improvement upon it.

The negative is first to be thoroughly dried by heat or otherwise, and as soon as it is cool it is coated with collodion just as in the previous method. The coating, however, need not be all over the film so long as the whole of the subject itself is covered. If collodion is not at hand probably almost any other kind of waterproof varnish could be used, but I have not tried any other. When the colllodion is dry a little fish-glue (Seccotine) is thinned out with a drop of water, to which a trace of dye or pigment is added. With a sable the edges of the subject are painted over with the mixture in a retouching desk, the coloring matter making it an easy matter to see whether any part has been omitted. Then the plate is laid flat, and the subject filled in with a larger brush so that the whole of the figure to be retained is covered with fish-glue As soon as this is dry, which may be hastened by warmth, the plate is mopped over with a mixture of equal parts of ether and alcohol to dissolve away the collodion from the background. If another kind of varnish has been employed naturally its appropriate solvent should be applied at this stage. The coating of fish-glue over the subject will act as a resist against the solvent, and so will prevent the varnish underneath it from being dissolved. The latter in its turn acts as a resist against the reducing solution, which is preferably applied with a mop of cotton-wool, as total immersion may find weak spots in the varnish. As soon as the background is reduced out, the plate is rinsed and mopped surface-dry, and the rest of the varnish dissolved. Then a good wash completes the process. In portraits it will be found an improvement to reduce the edges of the subject slightly after removal of the varnish, so as to avoid a cut-out appearance. This may be still further modified by pencil work, as the film is not injured in any way and may be retouched as usual.—D. Charles, in *B. J.*

---

[1] Abstract from paper by Samuel M. Burka, Ph.D., in *Journal of the Franklin Institute,* January, 1920, p. 25. Communicated by Dr. Enoch Karrer.

[2] Eder. Handbuch der Photographie, 1902, iii, 169, et seq. For the Bureau of Standards methods see Bulletin Bureau of Standards, 1917, xiv, 371.

[3] Eder. Handbuch der Photographie, 1902, iii, 169. Reference to Schumann, October, 1885; Phot. Wchnbl., 1885, p. 395.

Finishing Blocked-out Negatives

Many suggestions have been passed round for covering the portions of the background left uncovered after the outline of a subject has been done with opaque. To cover the whole with opaque is wasteful and not always effective, the paint being liable to abrasion in large areas. A paper mask is the most practical, but a P. O. P. proof nowadays is costly, and a black paper mask not easy to get even an approximately correct shape upon. The following has been found a remarkably quick and easy plan. When the outline band of paint is dry, the negative is laid flat on a table in a good light, and a brush well charged with the paint is drawn round just overlapping the line already made, making it about half an inch wide and rounding out any awkward corners. As soon as this is dry again the negative is laid film downward, this time on a printing box, and a few spots of seccotine put on the glass side in the corners and other convenient positions, but not over the subject itself. These spots are rubbed out thin and smooth with a finger-end till they become tacky, when a sheet of translucent red paper is laid down upon the glass. It is then a matter of an instant to run the point of a sharp knife around the subject, cutting through the paper. The subject can be seen, and the band of opaque gives plenty of latitude, so that there is no particular line to cut to. Thus a correct mask is made in a few seconds, and is already fixed to the negative.—*B. J.*

A Printing-box Dodge

About an inch below the plate-glass top of my printing-box is a shelf consisting of a sheet of ground-glass supported on a slat at each side. A slit in the box itself allows "vignettes" or "tissues" to be slid on this shelf at a suitable distance beneath the negative.

Finding it rather difficult to adjust the positions of pieces of tissue paper, for keeping back thin parts of negatives, without frequent lifting of the top of the printing-box, I have hit on the following dodge, which answers splendidly, as well as giving a practical method of damping down the light for weak negatives. Some tracing-cloth was obtained, and pieces were cut the width of the glass shelf and a little more than twice as long. Each piece was folded once, and the two edges opposite the fold pasted together to form a folder closed back and front and open at the sides. A metal ring was attached to each at the same time at one corner by narrow strips of the tracing cloth. One strip passed through the ring, and the ends with plenty of adhesive put between the two pasted edges of the sheet. Then another small pasted strip was passed through the ring, and stuck outside the folder, making, when dry, a quite untearable means of hanging the folders up when not in use.

I find three of these fill all possible requirements for regulating the strength of the light. When a negative needs dodging, it is laid on the box and one of the folders placed on top of it. Then the bits of tissue paper are slipped inside the folder, and when adjusted to the negative the whole is slid as one piece on the glass shelf below, without further trouble.—*B. J.*

A Lens-cleaning Hint

The advice to keep a special piece of chamois leather or old linen for cleaning lenses is excellent, but often is carried out in practice in a manner worse than useless, by the habit of keeping the cleaning material loose in the camera case, or lying about in a drawer or on a shelf where it picks up all sorts of grit. Frequent polishing then results in a beautiful cross-hatching of fine lines over the surface of the soft glass of which a lens may consist.

The method I have adopted is to have a chamois leather bag, and to use the inside of this only for wiping lenses. Thus the surface that does the work is always free from dust and dirt. For the benefit of those who work in the West-End of London, I may mention that a woman stands around Covent Garden market selling such bags, presumably as purses, for a few pence each, and these are strung with tape which forms a loop by which the bag hangs on a nail always handy when needed. I have been fortunate in buying a specially smooth white one from her of a softness not met with before.

When a chamois needs washing, it is easy to retain the softness. A thick lather of soap and warm water is used. "Lux" being quick and suitable for the purpose. The leather is rubbed out in the lather, squeezed, and hung up to dry *without rinsing.*—*B. J.*

Clean Trays Mean Better Prints

Don't you enjoy developing a batch of prints in a clean, white tray? There isn't any one thing in my opinion, more conductive to a better quality of results generally than clean equipment and the tray is perhaps the most important though the most neglected part of it.

A paper demonstrator came into the studio the other day and after the usual line of talk proceeded to demonstrate.

"I sure like to develop a print in a new tray," he remarked casually, as he poured some fresh developer into my pure white tray.

"Do you know just how old that tray is?" I asked him.

"Why, no; isn't it a new one?"

"That tray is just six years old," and noticing his surprise I passed the stunt on to him just as I am passing it on to you. I hope it helps you to have better prints.

I discovered the method by accident, though at the time I was trying to clean my developer tray. I had tried everything from common salt to muriatic acid, with no appreciable results. The tray in question was white once, but at that time it had become ashamed of itself and would have passed for anything but white.

The last thing I had used was some commercial sulphuric acid, full strength, but all I got for my pains was a couple of burned fingers. I was about to give it up as a bad job, and had started to put the various chemicals, when I spilled a few drops of a solution of potassium permanganate into the tray.

Presto! There was a clear, white spot wherever the solution had touched. I poured a generous dose of the solution into the tray and wiped it out with absorbent cotton. It worked like magic. A stain that had resisted every effort to remove it merely vanished. I rinsed the tray and then found a slight permanganate stain, which in turn vanished when I dipped my piece of cotton in the fixing-bath and wiped it out again. After washing I had a new tray, the same one which the demonstrator had called new six months later.

After a few experiments I found the following procedure to be the best:

Drop a few drops of commercial sulphuric acid in the bottom of your tray, which should have previously been rinsed with clean water. Swab this about the tray with a piece of cloth or absorbent cotton, being sure to use sufficient cloth or cotton to prevent burning the fingers and also being sure to bring the acid in contact with the entire surface of the tray. Then pour in about 1 ounce of a solution of permanganate, 100 grains to 32 ounces of water, and merely rub this around in the tray and watch the stain disappear. The permanganate will leave a slight stain, which should be removed by wiping over with your cotton dipped in the fixing-bath. Then wash your tray.

If you have the acid and permanganate solution handy it will take about two minutes for the entire operation.

Now go to it. You'll be better able to judge the tone and depth of your prints, detect fog and a hundred and one other things, all of which mean better pictures. Oh! there's great satisfaction in a clean tray.—A. J. Cunningham.

Radiographs Direct on Bromide Paper

A large number of *x*-ray photographs are now made direct on to bromide paper without any intervention of a plate. The possibilities of replacing plates by paper are, of course, limited; for paper is unsuited for the finest detail and gradation, which are only to be appreciated by transmitted light, and not by the reflected light which is used in examining a direct print. Nevertheless, as radiographers are finding out, bromide paper has its great advantage in economy and ease of manipulation when it comes to coarser subjects, such, for example, as undoubted fractures of bone. One radiographer who has been working on these lines says that the bromide paper of choice should be the most rapid positive paper that can be obtained (of the carbon or contrast type); and a surface about the same as that of a plate is to be preferred to an enamel surface. An intensifying screen should always be used, the tube should be softer than for plates, and the exposure for any special paper must be found by experiment. Metol hydroquinone, the usual developer for radiographic plates, can be used for these prints also, with the addition of some extra bromide.

Gas Leakage from Flexible Metallic Tubes

Photographers use a large quantity of flexible metallic tubing when enlarging or conducting other operations. Usually, the rubber ends fixed on the pipes are very serviceable, and prevent any escape of gas. But sometimes, after a bit of service, these become slack, and the gas leaks badly from the joints. Of course, the best thing in such a case is to get new rubber connecting pieces properly fitted on by the plumber.

But it may happen that the leakage is discovered when this cannot be done for the moment, and the worker has to devise some means of stopping the escape or else work under evil-smelling conditions. At a pinch ordinary soap can be rubbed well around and molded into position. Melted sealing wax can also be dropped around the joint, and even the children's plasticine can be utilized.

But the best material to use is ordinary orange shellac varnish, which should be fairly thick in consistency. It is brushed around the joints and allowed to set. When set, it is not hard like sealing wax, but slightly flexible: and thus it makes a good serviceable joint, bending with the play of the tube and not cracking and allowing the gas to escape.—*Photography.*

Photographing on Canvas

To the Editor Photographic Journal of America:

I noticed in your December number a set of descriptions of methods of photographing on painters' canvas, none of which, from my experience, promises good results, or is free from peeling away from the canvas, when organic surfaces are put upon the painted materials. Allow me to give a method which I invented before 1870, which was extensively published both by American and European journals. I have made some hundreds of prints both by the solar camera and contact methods, and the results are equal to the best of the P. O. P. prints, and at same time the matter of perfect contact with the material was thoroughly carried out. It cost me some months of constant experimenting.

First, I got rid of the oily surface by application of strong ammonia. But where the surface would not yield to that method, I used a solution of cyanide of potassium with it. I then washed with a strong stream of water and applied ordinary acetic acid to get rid of the alkalinity of the surface. Another rinse of water and allow it to dry.

It was "salted" with an alcoholic solution composed of 8 ounces of alcohol, denatured will answer, with 48 grains of gum mastic or benzoin, 48 grains of chloride of calcium and 5 grains of bromide of potassium and 48 grains of citric acid. This solution was flown over the same way as collodionizing a plate, and allowed to dry.

For contact printing it was silvered with a solution of nitrate of silver, 40 grains to the ounce of water, made as follows: water, 7 ounces; alcohol, 1 ounce; nitrate of silver, 320 grains. It can be either floated on this solution or it can be brushed on and allowed to dry.

For solar printing I always used the usual ammonio-nitrate of silver solution, to which 20 drops of pure nitric acid were added to each 8 ounces of solution; and printed while wet, after brushing it on. I also used a few drops of glycerin to keep it wet while printing. This solution printed much more rapidly than the plain silver, a very important matter in solar printing.

Do not forget this method will give perfect prints and will be a permanent part of the canvas surface. The toning and fixing were done the same as with plain salted paper, only a rather weak fixing bath was used.—David Bachrach.

Winter Troubles and Winter Precautions

Winter brings with it considerable inconvenience, and to none, perhaps, greater than to photographers, particularly if they are attended with a frozen water supply, for example.

Although up to the present there has been no prolonged severe weather, yet it has been cold enough to occasion inconvenience, and sometimes trouble, the cause of which has been unsuspected by some whose practical acquaintance with photography is somewhat limited. Indeed, we know of more than one instance of trouble, due entirely to depressed temperature, the cause of which was actually unrealized by the photographers, yet they were professionals, though, we may add, not with a very extended experience in the business. The trouble here referred to was at first attributed to the quality of the plates; they were charged with being slow, though they were of a very quick brand; also that they would not yield sufficient printing density. In each case the difficulty, when the cause was explained, was got over by warming the developing solutions and the dishes to about 56° or 70° F., as well as the dark room itself. It is commonly recommended at this season to warm the developer up to this temperature, but a little consideration will show that the advantage gained is quickly discounted if the temperature of the room itself is not much above 40°, and this is frequently the case with some dark rooms. Under such conditions the solutions rapidly cool, and the advantages, gained at first, become next to nil before the development is complete, if it is at all long, and in the case of underexposure it may necessarily be so.

When there are no other means of heating the room, a kerosene stove becomes very convenient. One with a four or four and a half inch wick will keep a good-sized dark room at a genial temperature, and the solutions in good working order during the daytime, and with a common kerosene lamp, with an inch wick, will do the same during the night with the door shut, notwithstanding that the outside temperature may be at the freezing point. Objection is sometimes raised to kerosene stoves on account of smell. This objection becomes groundless, as it does with oil lanterns, if the wicks be kept nicely trimmed and the outsides of the reservoirs perfectly clean. Although the fumes from a neglected oil stove are unpleasant to smell, they, unlike those from coke or gas, have no injurious action on photographic operations.

Depression of temperature retards chemical action, and has a marvellous effect on the fixation of both negatives and prints. They fix much slower than when the solutions are warmer, but in the case of negatives the effect can be seen, and if care be taken that the plate remains in the fixing bath for double the time it took to remove the bromide of silver, not much trouble will be met with as regards that operation. But if not, and the negative has to be intensified, stains may well be anticipated. In the case of paper prints there is no such guide as to complete fixation and the conversion of the hypo-silver salts into the freely soluble condition, and, as a result, yellow stains frequently make their appearance when the prints are finished, owing to their being insufficiently fixed. At this season of the year, if the fixing bath is anything under 30° and the room is cold, at least double the usual time in the solution should be allowed to insure that the prints are perfectly fixed, and the hypo-salts of silver brought into the freely soluble state necessary for their entire removal. Even when this is done there comes the question of washing.

When the water is very cold it has not the same solvent action on the hypo in the films, whether plates or paper; hence, unless the washing waters are warmed, a longer time should be given to the washing; but in the majority of cases this is not done. Indeed, when the operation is intrusted solely to inexperienced lads and girls it is often curtailed on account of the unpleasantness of having to be continually dabbling in abnormally cold water. Where the albumin, or the collodio-chloride, processes are employed this is not so likely to be the case as with them. Warmer or even hot water may be employed for the washing. This treatment the majority of gelatin papers will not stand.

Having alluded to some of the troubles that winter cold may bring about, there is perhaps a still greater one that may beset the professional worker—namely, a frozen water supply. This, in the greater number of cases, may be avoided were a few timely precautions taken; yet they are too often neglected until too late. There is now sold by most of the large hardware stores a thick felt, made specially for binding round exposed water-pipes. This felt is an excellent non-conductor of heat, and affords a good protection to the pipes. In place of that the hay bands, with which trusses of hay are bound together, if wound round the pipes answers well. When the service pipe from the street main is laid near the surface of the ground, as is too often the case, six inches of stable manure laid on the ground above it will prevent the frost from reaching the pipe. Another good way of preventing the water from freezing in the pipes is to leave the taps continually dribbling. This, of course, the water companies would object to if they knew it; but they need not be consulted on the subject. If the water is paid for by meter they raise no objection, of course, and the slight extra cost to the consumer is sometimes amply compensated for in the avoidance of a frozen-up supply and, perhaps, burst pipes. If perchance, for want of due precaution being taken, the pipes get frozen, they should, without delay, be examined from end to end to see if there are any bursts. If there are, they will be seen as enlargements of the pipe at those places, and the services of a plumber should be sought at once to do the necessary repairs. If this be neglected, it may result in the flooding of the place when a thaw sets in, and possibly much damage being done.

Some Points in Copying—II

Some method of lighting by artificial light is desirable for two reasons. It enables copying to be done in the evenings or the late winter afternoons, and if of low power it enables untoned P. O. P. prints to be copied, an excellent way of getting combined results from two negatives, as, for instance, a groupof two children, one of whom has moved in one negative and the other in another. For small originals, up to, say, whole-plate, a couple of incandescent gas burners, or of 50 c.-p. filament lamps, place one on each side of the copy-board, answer admirably. Exposures are not unduly prolonged, particularly if orthochromatic plates are employed. The light must be diffused through thin white silk or thin tracing linen, and dead-white reflectors used, which will cut off all light from the lens. The lamps should be movable, and, if electric, four may be used when larger originals are being copied, one over the other on each side. It must be remembered that if orthochromatic plates are used they will be relatively more rapid to such light as the incandescent electric than they are to daylight, and that a given light-filter will have a lower multiplying factor with such light than with daylight. Mr. Arthur Payne, states that to the light of an argand gas-burner an ortho-plate is three times more rapid than an ordinary plate of equal speed to daylight. That is, assuming two plates of equal speed (taking the word speed as ordinarily used), one ortho and the other ordinary or non-ortho, the ortho-plate will require one minute exposure where the ordinary plate will require three minutes. Further, an adjusted filter of the tartrazine or filter yellow K type, which with such a plate increased exposure 30 times to daylight, only increased it 10 times to the argand light. From this it follows that the use of an ortho-plate with such a filter will only necessitate an exposure 3½ times that required by the ordinary plate.

The principal advantage, however, of the ortho-plate and filter in such artificial light will be found when copying monochrome pictures in non-actinic colors, such prints, that is, as sepia-toned bromides, red-chalk carbons, rich brown photogravures, or etchings, and so on. Working with an ordinary plate in daylight (and still more so in the light of an enclosed arc) it is difficult, if not impossible, to get the shadows exposed without gross overexposure of the lights, resulting in a flattening of their tones. Even with such very full exposure, it often happens that the *surface* is photographed as much as the *image*. Most of our readers will remember Messrs Wratten's comparison prints showing a dark-slide photographed on ordinary and on screened panchromatic plates, the one showing surface smears and scratches and the other the grain and figure of the mahogany. This is what we get in varying degrees with almost any type of non-actinic print, though the layer of yellow polish on the wood paralyzes the ordinary plate more than any print surface does.

We must point out that if originals in colors are copied in such yellowish artificial lights as we have mentioned a special filter should be used. If the plate and filter which give proper correction in daylight are employed, the yellows will be rendered too light and the blues too dark. Probably it would be wiser to do copying of originals in colors by daylight, but a few experiments might be made with a lighter filter, say Kii. instead of Kiii., comparing the daylight copy of a color chart made through Kiii. with the artificial-light copy of the same made through Kii. This, of course, is a somewhat empirical method of arriving at a satisfactory result.

The question of exposure is fairly simple, but copying to a larger scale necessitates increases of exposure which are surprising to one unaccustomed to the work, and underexposures are often made. It is convenient to take a same-scale copy as a basis, as this is very frequently required and once a system of working has been arrived at, there is little difficulty.

A convenient method of ascertaining exposure for the same-scale copy is to take standard conditions as follows:

Aperture of lens . . . *f*/8 nominal
Plate speed . . . . . Watkins 65
Watkins' indoor Bee meter, *i. e.*, light or quarter tint meter.

Hang the meter against the original on the copy-board, the dial turned toward the light, and note the time taken to match the painted tint. The exposure will be in direct proportion to this time and according to the character of the original, as follows:

Classification of Originals

	Fraction of meter time.
A. Platinotype or bromide, matt silver, light water-color drawing, pencil drawing	1/30
B. Glossy purple P. O. P., black carbon, brown silver, or sepia platinum, dark water-color, black photogravure	1/16
C. Brown photogravure or etching, strong sepia-tones bromides, red chalk prints or drawings, sepia carbons	⅛
D. Strong red chalk prints, strong black or brown gum-bichlorate prints, warm black or brown bromoil prints	¼

The increases of exposure in classes B, C, and D, are required partly on account of greater strength and richness of image and partly because of the non-actinic color of the image. If screened ortho-plates are used, therefore, the increase will not be so great.

It will be obvious that in cases where a smaller stop than the nominal *f*/8 is required the stop may be used which will enable plate and meter to be exposed simultaneously. Thus for Class C. we might use nominal *f*/22, and for Class D. nominal *f*/16. This saves the time of making a test. But it well to acquire the habit of *thinking in the f*/8 (*nominal*) *stop*, for this gives a common starting-point for all calculations.

In copying, the nominal *f*/8 stop never is *actually f*/8, but varies with the variations of the conjugate inside the camera, and these variations may be allowed for in various ways. With symmetrical lenses the value of the stop may be calculated and exposure based on that. Thus, in copying same scale the nominal *f*/8 stop becomes *f*/16. Our basis is same-scale copying, so we start from *f*/16 actual aperture. If the lens is of 10 inches focal length, the diameter of its *f*/8 stop will be approximately 1¼ inches. Now, if the conjugate from lens to plate is 14 inches, we can arrive at the actual aperture by 14 ÷ 1¼, which gives 11⅓, or practically *f*/11. In the same way a conjugate of 34 inches would mean an actual stop value of *f*/27, requiring an exposure half-way between *f*/22 and *f*/32, or half as much again as *f*/22.

But in practice this method is likely to lead to confusion, and we only mention it in order to point to a better way and to make it clear that the following scale tables do make allowance for the variations between nominal (or marked) stop values and actual values. This better method is simply to find the exposure for same-scale copying in the manner described above, and then to multiply this exposure by the ratio figure in the table. We have found the following work well, and it may be carried quite easily in the mind. Calculate exposure for a same-scale copy, and then the ratios are:

Same-scale copy (1—1)	1
Half scale or about (½—1) . . .	½
Quarter scale or less (¼—1) . . .	¼
Half as large again (1—1½) . . .	2
Twice as large (1—2)	3

Dedenham's table, which may be found in the Almanac (B. J. A., 1910, pp. 900–901), gives the following ratios:

Same scale	1
Enlarged 2 diameters	2¼
“ 3 “	4
“ 4 “	6¼
“ 5 “	9

The use of the meter might be troublesome with the gas or 50 c. p. indandescent electric lamps, but as such lights are reasonably constant it is easy to establish absolute figures, *i. e*,, copying bromide print same-size under standard plate and stop conditions, lamps 18 inches from originals—so many seconds exposure, etc.

It may be remarked that we have not included in our table of classified originals such subjects as strong lithographs, oil paintings, and the like. Such originals vary so much that classification may be more misleading than helpful. In the case of oil paintings the thickness of the various coats of varnish and the dirt imprisoned therein will vary enormously. Each picture must be a problem in itself, and if the worker is doing such work continually his notes will be a valuable guide in dealing with every fresh subject. In other cases a trial may be made on a smaller plate, such plates including, if possible, both the lightest and darkest bits of the subject. We need scarcely say that panchromatic plates should be employed, and very often one or two tests made with various filters, in order to see which best gives the effect of the original.—*B. J.*

(*To be Continued*)

Double Fixation of Prints

If any subject more than another has cropped up with regular frequency in questions addressed to us by correspondents during the past two years it has been the occurrence of stain of one kind or another on development prints. Some of these confessions of difficulty have evidently had their origin in the carrying out of the fixing process in an altogether superficial manner—by far the most fertile cause of stains, yet one which many inquirers are unprepared to admit. Others, as we have known from the quarters from which they emanated, marked not perfunctory manipulation, but a disturbance of conditions which has its counterpart in the results obtained. Although manufacturers have not said so in so many words, at any rate in a public announcement, it is perhaps common knowledge that the change from pre-war to fresh supplies of the raw paper which they coat with their emulsions—a change forced upon them by the war—has added to the many other difficulties of the time. It is, in fact, a matter for simultaneous wonder and congratulation that users have been kept supplied with printing papers which differ to so small an extent from those which they obtained in the almost forgotten days of peace. Makers have maintained the uniformity of their products in a great number of respects, but obviously, when important changes have to be made on compulsion in raw material which is used in a manufacturing business it is an impossibility to preserve the standard qualities of a product down to the last particular.

The susceptibility of the emulsion coating, or, perhaps more correctly, of the paper base itself, to retain the silver compounds which are rendered soluble while in the fixing-bath has been one of these. It is, however, no new phenomenon but one which, under the name of "retained silver," has occupied the attention of experimenters for many years past. The new conditions created by the war have been responsible for raising it to a point at which it had not to be searched for, as in former days, but was liable to make itself unpleasantly evident in the course of ordinary working in the shape of yellowish or brownish stains, which made their appearance on prints within some days of making and under working conditions which previously had been found to be without any ill-effects.

In all those cases which have been submitted to us—and they have been pretty numerous—we have advised more thorough fixation as a cure for the disease. And by more thorough fixation we have indicated not merely the use of a stronger fixing-bath or a longer immersion of the prints in the bath, or a more careful exposure of each print in turn to the solution—though all these are good things—but the use of a second separate fixing-bath which is in fresh condition when the prints are put in it. There is nothing new or original in this suggestion, which is one of the many useful and scientifically tested expedients which photographers owe to the exploratory and public spirit of our French friends, MM. A. and L. Lumière, and their collaborator, Dr. Seyewetz. It was as the result of seeking to free prints from silver compounds to a degree which showed negative results on the application of a delicate test for silver that MM. Lumière were led to advise the use of two fixing-baths in succession, or, rather, the extra use of a fresh hypo bath after prints had been fixed in the ordinary way. Their suggestions and the tests upon which they were based have been described in a paper by them. In that paper it was directed that prints should be first fixed for about five minutes, then washed for one hour in fifteen-minute changes of water, again fixed for five minutes in a fresh hypo bath, and finally washed for about one hour.

In laying down this routine it was clearly the object of the authors not to prescribe rules for commercial working, but to state the process by which soluble silver compounds in the prints could be removed with the nearest approach to completeness. In the handling of large batches of prints and postcards, where time and the labor of assistants are both essential factors it is necessary to simplify the procedure as much as can be done without materially sacrificing the efficiency of the method. From this standpoint little, if anything, will be lost by transferring prints directly from the first fixing-bath to the second, or the intermediate washing may be cut down to a mere rinse in a large volume of water, which will be sufficient to wash off such of the first fixing-bath as clings mechanically to each print. The chief thing—and here there should be no departure from MM. Lumière's instruction—is that the second fixing bath should be a fresh one, in which prints have not previously been fixed. Such a method is not really as lavish of hypo as appears at first sight, since the second bath can be used in smaller bulk (for a given batch) and prints well turned over in it, and further, when it has served its purpose, can be used as the first bath, and this latter in turn may find application for the fixing of negatives, in which work its gradual approach to exhaustion is directly brought to the notice of the operator. We are convinced that this procedure suffices to put an end to complaints of stains—an opinion which we hold on the ground, among others, that in cases where we have found no complaint of such stains from trade workers handling a large quantity of material we have also found that the use of two fixing baths had long been their practice.—*B. J.*

Formulas for Reducers

Farmer's reducer has probably been more extensively used than any other, as it was introduced long before the others were known. The writer, however, prefers the action of permanganate to that of the red prussiate used in Farmer's reducer because very few negatives can be improved by reduction unless they were overdeveloped, and, if they were overdeveloped with pyro they usually have a pyro stain. Permanganate removes this stain and thus makes less reduction necessary. Farmer's reducer does not remove pyro stain, so that its action is only of benefit in the removing of silver.

The permanganate reducer is especially convenient for the amateur who does not care to weigh out and mix the separate chemicals. This reducer can be obtained, in small glass tubes, from all kodak dealers, under the name of Eastman Reducer, while the others must be made up by the photographer himself.

Negatives that are to be reduced should be placed in water for about twenty minutes before they are immersed in any reducing solution.

The tray in which a negative is being reduced should be gently rocked to insure uniform action of the reducer.

No reducer that is mixed, ready for use, will keep in good working condition for any length of time, and after it has been once used it should be discarded. It is economy to use a fresh solution for each negative.

If a negative is still too dense after it has been reduced the process of reduction can be repeated. All the chemicals must, of course, be washed out of the negative before the second reduction is undertaken.

The hands should always be washed after using reducers as some of the chemicals of which they are composed are poisonous.

Avoirdupois weight is used in the following formulas:

Farmer's Reducer

For removing an equal amount of silver from all parts of a negative.

Water	4 oz.
Hyposulphite of soda . . .	1 oz.

After the hypo has been dissolved add just enough red prussiate of potash to make the solution a lemon yellow color.

The negative must be thoroughly washed after it has been reduced.

Permanganate Reducer

For removing a little more silver from the dense than from the thin parts of a negative.

SOLUTION A

Water	1 oz.
Permanganate of potash . .	24 gr.

SOLUTION B

Water	1 oz.
Sulphuric acid, c. p.	24 min. or drops

Take 1 dram A, 2 drams B and 8 ounces water. When the negative has been sufficiently reduced immerse it in a fresh acid fixing-bath and leave it there for a few minutes after all the color which the reducer may have imparted to the negative has disappeared. Then wash the negative thoroughly.

Persulfate Reducer

For removing much more silver from the dense than from the thin parts of a negative.

Water	4 oz.
Persulfate of ammonia . .	$\frac{1}{8}$ oz.
Sulphuric acid, c. p. . . .	20 min. or drops

The speed with which this reducer acts increases as reduction proceeds. The appearance of a trace of milkiness, when a negative is being reduced, indicates that reduction is speeding up. At this stage the negative must be closely watched, and it should be taken out of the reducer just *before* enough silver has been removed, quickly rinsed and *immediately* immersed in a fresh acid fixing-bath, where it should be left for a few minutes, and then thoroughly washed.

Just when to stop the reduction can only be learned from experience, and those who have had no experience with this reducer should experiment with negatives that are of no value before attempting to reduce one that is valuable.

A negative that has been reduced too much with persulphate is too flat, because the contrast has been removed and it cannot be replaced by any method known.

Proportional Reducer

For removing silver from a negative in proportion to its density. For instance, if 25 per cent. is removed from the high-lights, 25 per cent. will be removed from the half-tones, and 25 per cent. from the shadows.

Solution A

Water	16 oz.
Permanganate of potash . .	2 gr.
10 per cent. solution of sulphuric acid, c. p.	$\frac{1}{4}$ oz.

Solution B

Water	32 oz.
Persulfate of ammonia . .	1 oz.

Take 1 part A and 3 parts B. This will usually reduce the negative sufficiently in three minutes' time. After the negative has been reduced it must be rinsed and then given a five-minute immersion in a 1 per cent. solution of meta-bisulphite of potash, or bisulphite of soda, after which it must be thoroughly washed.—*Kodakery.*

Permanence of Kallitype Prints

Mr. David Bachrach writes to *Abel's Weekly* on this subject: During my over fifty years' experience as a photographer I have handled and studied almost every kind of photographic print except gum prints, and have made the subject of permanence a study. The weakest of all photographic prints are the P. O. P. gelatin prints, and next to them are the old salted and silvered paper prints not toned with gold. They are more permanent when thoroughly toned with gold, fixed in fresh hypo, and well washed.

The kallitype print is of about the same permanence as the old plain-paper prints not toned. A developed print, made on modern developing papers, is the most permanent of any silver image, as the metal is present in large quantity and more like the pure metallic silver of the old collodion process in making negatives. But they must be carefully manipulated to be permanent.

Those prints can be made almost as unchangeable as platinum prints, if thoroughly fixed, by toning them in the sulphide method, either in connection with a solution of hyposulphite of sodium or by the more direct method. Sulphide of silver is the most unchangeable of all silver products, and is not affected by the atmosphere. I have given these things most careful tests, years ago.

Now if the kallitype prints can be made by some modification that will allow them to be toned by the sulphide process, they can be made about as permanent as the developed prints. I have no time or disposition to try the experiment, and I will leave that to the younger men to do.

The Time-saving Tank

Now that the busy season is at hand it is well to examine any labor-saving devices with a view to adapting them. To my mind one of the best ways of saving time is by using tanks in place of dishes for development, not necessarily using the Time system, but using tanks for their greater holding capacity.

Let us take a case. The owner of a one-man business is busy operating all day; at perhaps about 9 P.M. he finds himself faced with the task of developing, let us say, 160 half-plates. If he used dishes he would hardly be able to develop more than eight at one time; in which case, allowing ten minutes' development for each plate, he would take three and one-half hours to finish the job. But now suppose he is using tanks—two of them, each taking twenty-five negatives: he can give the same personal attention to each negative, putting those for special treatment into a dish when found necessary, and yet, allowing the same time for development, he will only take half an hour over the job, a saving that is surely worth while.

I may be told that dish development is already obsolete, but I do not think this is so. Especially in middle-class studios it is a common thing for an assistant to have such a job as I have given above, and nothing to do it with except a couple of whole-plate dishes. Surely it is time that this sort of thing was past, for in no industry but ours would such a waste of time and labor be permitted for a moment. An improvement in results may also be expected. It is too much to expect of frail human nature that an assistant will give much "personal attention" to dish developing at midnight, but he will gladly do his best when he knows his hours are not being lengthened by the use of out-of-date apparatus. —A. G. Willis, in *B. J.*

The Saving of Residues

Every photographer should save his residues, as it is possible, if any considerable amount of work is done, to obtain quite a decent sum in the course of a year. Particularly is this the case when amateur finishing is part of the business.

Every piece of waste paper and film should be preserved. I have in my dark-room an empty hypo keg, and into this is thrown every bit of waste and spoilt film negative, and I find that my amateur customers are quite willing in nine cases out of ten to leave their spoilt films behind. When the keg gets full the contents are jammed down with a stick till it is no longer possible to put more in, and then the keg is taken out into the backyard and the contents dumped into a home-made combustion chamber. This was made out of corrugated iron with a stout sheet-iron bottom and another sheet for a lid.

At one side near the bottom is cut a small door, which allows me to fire the mass, and I take good care to collect a few films and place just inside this door. The waste is not tightly packed, merely lightly dumped in, the lid put on, and then a match applied to the films. These burn fairly rapidly and soon set fire to the lot, and it is allowed to burn itself out, with an occasional stir with a poker. The ashes are not disturbed till possibly the next day, when everything has cooled down. They are then carefully collected and packed tightly into an empty wooden plate case, which is kept till full.

Naturally the chief source of residues is the fixing bath, whether for plates or paper, though the latter has much less silver in it than the former. To collect the residues, an empty oil barrel is used, with the head knocked out, and this has its permanent place in the yard. When a fixing bath gets too dirty it is poured into a pitcher and emptied into the barrel, and no attempt is made to precipitate the silver till the barrel is half full.

There are several methods of throwing down the silver, and the one I prefer is scrap zinc. Liver of sulphur is not quite so cleanly, nor as economical really; because with zinc one obtains metallic silver, whereas, with liver, silver sulphide is thrown down.

I buy the cheap variety of liver, as it is just as good for this purpose as the purer kind, which is double the price. A wide-mouthed bottle is used. As a matter of fact I obtained from a nearby soda fountain some quart fruit-jars with glass lids, and the liver is turned into these, a pound to the bottle, and then filled up with warm water and the whole left with an occasional stir till the lumps dissolve. The strength of the solution is of no moment, only the less water used the less there is to get rid of later. These bottles are kept out in the yard also, as liver is not nice stuff to have in the dark-room. If sulphide toning is resorted to, then the used sulphide solution is also dumped into the barrel.

When I want to throw down the silver, about a pint of the strong liver solution is stirred into the barrel and the whole left till the next day, when it will generally be found that the upper portion of the liquid will be clear and more or less white. A little is then dipped out with a teacup and a drop or two of strong liver solution dropped into it. If the solution remains clear on stirring, then I know that all the silver is down; but if there is any sign of a precipitate more liver solution is added, the whole well stirred up, and the barrel left till the next day, when a further test made.

As soon as all the silver is proved to be thrown down, the barrel is allowed to stand without being disturbed for two or three days or a week, and then the clear solution baled out with a tin dipper and thrown down the drain. This naturally makes room for more fixing-bath, and thus it really takes quite a while to get the barrel full. Actually I have two barrels in use.

The silver, which is precipitated as sulphide, is then scooped out as a thick liquid and put into cheap enamelled-iron pans and placed in the cellar till most of the water has evaporated. In the winter this is easy, as the pans are put on the top of the furnace and left there till quite dry, then the sulphide is broken out and packed up with the ashes of the papers and films and sent off to the refiners.

Formerly I used old barrels, and when they are full of the silver sludge I bung up the hole tight and send off to the refiners; but I found the freight charges were too heavy and so I determined not to send more water than was actually necessary. There is just one point, and that is in declaring the contents to the railway company, make sure to say that it is silver residues; if you do not and any loss is sustained you cannot get compensation.

All this may seem a lot of trouble, but the actual work is very little and can be done in any odd moment, and if you are doing anything like a decent business the monetary return will make quite a nice showing. At any rate, mine last year ran well up into three figures.—*The Photographic Journal.*

PATENT NEWS

Color-sensitized photographic materials. F. F. Renwick, Brentwood and O. Bloch, London. Eng.Pats. (*a*) 133,769 and (*b*) 133,770, 15.10.18. (Appls. 16,845 and 16,846/18).

(*a*) A light-sensitive emulsion or film is treated with a dye of the auramine $[N(CH_3)_2C_6H_4]_2$: C:NH, or iminodiphenyl class, which increases the blue sensitiveness. For the bathing process a solution of strength 1:50,000 may be used; if the dye is added to the emulsion from 0.005 to 0.025 gm. per liter may be used. (*b*) A light-sensitive emulsion or film is treated with a dye of the auramine class together with one or more dyes of the isocyanine class, such as sensitol red (pinacyanol). The effect obtained is generally both different from and greater than the sum of the effects of the two dyes taken separately; for instance, auramine and sensitol red, used together in this way, give a greater red and green sensitiveness than sensitol red alone and also new sensitiveness to the deep red. The quantities of auramine required are similar to those of the other sensitizing dyes, but the auramine may be increased so as to operate as a yellow screen as well as a sensitizing dye. Plates with freedom from fog and with good keeping properties as well as of high color-sensitiveness may be obtained by this process.

Photographic plates and pictures; Manufacture of ——. J. H. Christensen, Holte, Denmark, Eng. Pat. 132,846, 18.9.18. (Appl. 15,194/18.)

A TRANSPARENT sensitive film is made by coating with an emulsion obtained by diluting an ordinary emulsion with gelatin solution to about $\frac{1}{20}$ or $\frac{1}{30}$ its normal silver content. Such a film on exposure and development gives an image which is too thin for printing or other purposes but which can be intensified, preferably by a process which depends on the conversion or replacement of the silver image by a substance such as silver or cuprous iodide having strong absorbent properties for certain dyes. Formulæ are given of several suitable solutions for the treatment of the silver image. After treatment the plate is washed, treated with a solution of a suitable basic dye or an acid dye such as acid rhodamine or fast green and again washed to remove excess of dye; the treatment before dyeing may be in two parts, the first being a bleaching of the image to silver bromide, for instance by an ordinary bleaching bath, and the second a treatment with a solution containing thiocarbamide (thiourea) to render the image more dye-absorbent. Such sensitive films are very suitable by reason of their transparency for two- or three-color single-exposure processes, the two or three sensitive films being placed close together with the interposition of suitable color filters, or staining of the films themselves.

[*Photographic*] *emulsions poor in gelatin; Process for preparing* ——. W. Merckens, Charlottenburg. Ger. Pat. 301,291, 6.3.17.

SLIGHTLY alkaline emulsions containing only 1 per cent. or 2 per cent. of gelatin are treated with formaldehyde, aluminium acetate, or aluminium formate, workable emulsions having viscosity and setting power similar to those of untreated 8 per cent. or 10 per cent. solutions being easily obtained.

Photographic development with amidol; Accelerating power of normal sodium sulphite in ——. *Abribat. Bull. Soc. Chim.*, 1919, 25, 569—571.

AN excess of sodium sulphite up to twelve times the weight of amidol used considerably accelerates the development of the photographic image. It is shown that this acceleration is due to reciprocal catalytic action of the sodium sulphite in the oxidation of the amidol. Other oxidation catalysts were shown to produce a similar effect.

Color photography. W. Friese-Greene and F. Garret, London. Eng. Pat. 134,238, 25.9.18 (Appl. 5162/18.)

IN two-color photography where two superimposed plates or films are simultaneously exposed, one or both of the films is color-sensitized by treatment with a solution containing approximately, in 65 pints of water, 2 grs. of pinacyanol, 6 grs. of pinaverdol, 2 grs. of pinachrome, 4 grs. of flavasine, and 4 oz. of ammonia (sp. gr. 0.880).

Photomechanical screen and process of making same. J. A. H. Hatt, Brooklyn, N. Y., U. S. Pat. 1,317,493, 30.9.19. Appl., 11,10.16.

A TRANSPARENT plate is coated with a light-sensitive layer and the solubility of this layer is changed by the action of light in accordance with the desired screen figure. The relatively soluble portions of this layer are dissolved out to provide minute light-transmitting spaces between the screen figures.

Photochemical etching process. J. Rieder, Berlin-Steglitz. Ger. Pat. 312,657, 16.4.18. Addition to Ger. Pat. 309,376.

THE process described in the chief patent is modified by the addition to the developing agent (alcohol, acetone, etc.) of a small quantity of the etching medium. To prevent the penetration of the etching medium a thin coating of a resin such as shellac is given. The etching liquids recommended, mixed with alcohol in each case, are nitric acid for steel, ferric chloride for copper, and hydrofluoric acid for glass.

Silver halide emulsions; Ripening process for ——. H. Müller, Leipzig. Ger. Pat. 313,180, 22.8.18.

FOR the purpose of obtaining steep gradation in an emulsion it is treated with a solution of pepsin in dilute hydrochloric acid, an emulsion so treated being capable of being ripened by the usual processes without noticeable increase in size of grain.

Fine-grain color screens for color photography; Process for the preparation of ——. Chem. Fabr. Buckau, Magdeburg, and T. Silbermann, Halle. Ger. Pat. 313,008, 14.6.14.

MAGNESIUM carbonate is used as the color carrier. It can be obtained as fine transparent grains of uniform size, which easily take up coloring matter.

Latent [*photographic*] *image.* F. Propf. Phot. Korr., 1919, 56, 141–143. Chem. Zentr., 1919, 90, iv, 435.

THE addition of finely divided metallic silver to a metol-quinol developer produces no effect, while the addition of precipitated silver bromide or of bromine produces oxidation of the developer. It is concluded that the development of exposed films of silver halide with chemical developers is not due to the separated silver but to the halogen.

Vol. 57. No. 3 March 1920 20 Cents

The Photographic Journal
of America

Smithsonian Institution
MAR 11 1920
National Museum

Published Monthly
With Illustrations

Efficiency in the Printing Room

can never be obtained with make-shift or antiquated equipment. A reliable, scientifically correct, modern printing machine is essential in the production of work of highest quality.

The Ansco 11 x 14 Professional Printing Machine is designed for general use. It is easy to install, economical to maintain and uniformly dependable as to light.

PRICES and full description of this Printer and other Ansco professional apparatus for photographic studios will be mailed on request.

ANSCO COMPANY

BINGHAMTON, N. Y.

New York	San Francisco	Chicago	Toronto
129-131 West 22nd St.	171-173 Second St.	308 N. Michigan Blvd.	347 Adelaide St., W.

THE PHOTOGRAPHIC JOURNAL *of* AMERICA

REGISTERED IN THE UNITED STATES PATENT OFFICE

NEW SERIES: WILSON'S PHOTOGRAPHIC MAGAZINE

AN ILLUSTRATED MONTHLY DEVOTED TO THE SCIENCE AND ART OF PHOTOGRAPHY

THE OLDEST PHOTOGRAPHIC MAGAZINE IN AMERICA
Founded 1864

Incorporating:
The Philadelphia Photographer The Photographic World

THOMAS COKE WATKINS, Editor

CONTENTS FOR MARCH, 1920

Constructive Portraiture . . . "Professional" 91
Photographing Upon Wood for Engraving Purposes. Part I . . Alfred J. Jarman 94
On Sitting Positions . . . Sidney Allan 98
Editor's Table—The Key to Business Success . . . 103
The Studio—Practical Papers on Studio Work and Methods . . . 105
Abstracts and Translations . . . E. J. Wall, F.R.P.S. 110
Views and Reviews . . . 112
The Workroom . . . 114

YEARLY SUBSCRIPTION, in advance, postage paid, United States, Mexico, Cuba, Philippines and Porto Rico, $2.00; Canada, $2.35. Countries in the Postal Union, $2.75. Single copies, 20 cents.

REMITTANCES may be made at our risk by money order, check, draft, or registered letter.

SUBSCRIPTIONS begin with current issue.

Published by EDWARD L. WILSON COMPANY, INC.,
THOS. C. WATKINS, President. 701 Arch Street, Philadelphia, Pa.
EXECUTIVE and EDITORIAL OFFICES, CAMERA BUILDING, 122 EAST 25th ST., NEW YORK CITY
HOUGHTON'S, Ltd., London, Eng., Agents for Great Britain
American News Co., Distributors for U. S. Kodak Australasia Ltd., Sydney, Agents for Australia
RICHARD HILL, Devonport, Auckland, Agent for New Zealand

Entered at Philadelphia Post-office as Second-class Matter

This is one of a series of sketches on Leading American Photographers.

American Photographers

WM. SHEWELL ELLIS:—It has been said that artists are generally poor business men. But Mr. Ellis is the exception that proves the rule, for while all his work is artistic in the extreme, it is of such a nature that it has a practical commercial application.

Aside from his national and international repute as a portrait photographer Mr. Ellis has achieved unique distinction through the use of his photographs as cover designs by the Saturday Evening Post and other national publications. For the past six years he has won the annual Kodak prize of $500 for the best photograph submitted in their advertising competition. Mr. Ellis' cover designs and illustrations, like his portraits, are truly masterpieces of composition and originality.

It is not surprising to find Mr. Ellis' studio equipment complete in every detail. As far as lenses are concerned, he has found a suitable scope of work for each of our "big three,"—the Velostigmat F:4.5, Vitax F:3 8 and the Verito F:4. The Velostigmat is pictured at the left.

Our new catalog fully describes and illustrates these three popular portrait lenses. Let us send a copy.

BY INVITATION MEMBER OF

NEW YORK, U.S.A.

WOLLENSAK OPTICAL CO.

ROCHESTER, NEW YORK.

AMERICAN MADE

REXOLON

DEVELOPING AGENT

Rexolon is a new universal developing agent. Rexolon offers unusual, distinctive and important advantages over all other developing agents.

1. Rexolon is chemically pure and lasting.
2. Rexolon is distinctive for the non-oxidizing qualities. It will stand in an open solution twice as long as German metol
3. Rexolon is non-poisonous to the skin, a characteristic which will appeal to all subject to metol poisoning.
4. Rexolon is a soft developer, greater contrast can be obtained by the addition of bromide, which within certain limits does not affect the tone.
5. Rexolon will produce good blacks and whites even if the negatives are under or over exposed.

Rexolon is being rapidly stocked by all photo dealers. It will pay you to give it a trial.

Put up in one, four and eight ounce bottles, also in one pound bottles.

One ounce bottle........................$1.35

CHICAGO = **Burke & James Inc** = NEW YORK

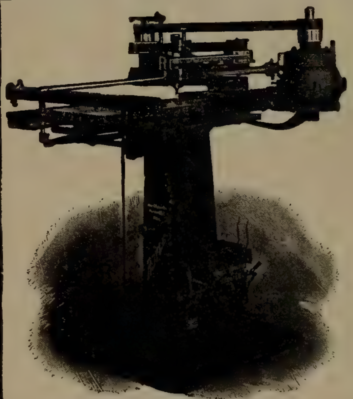


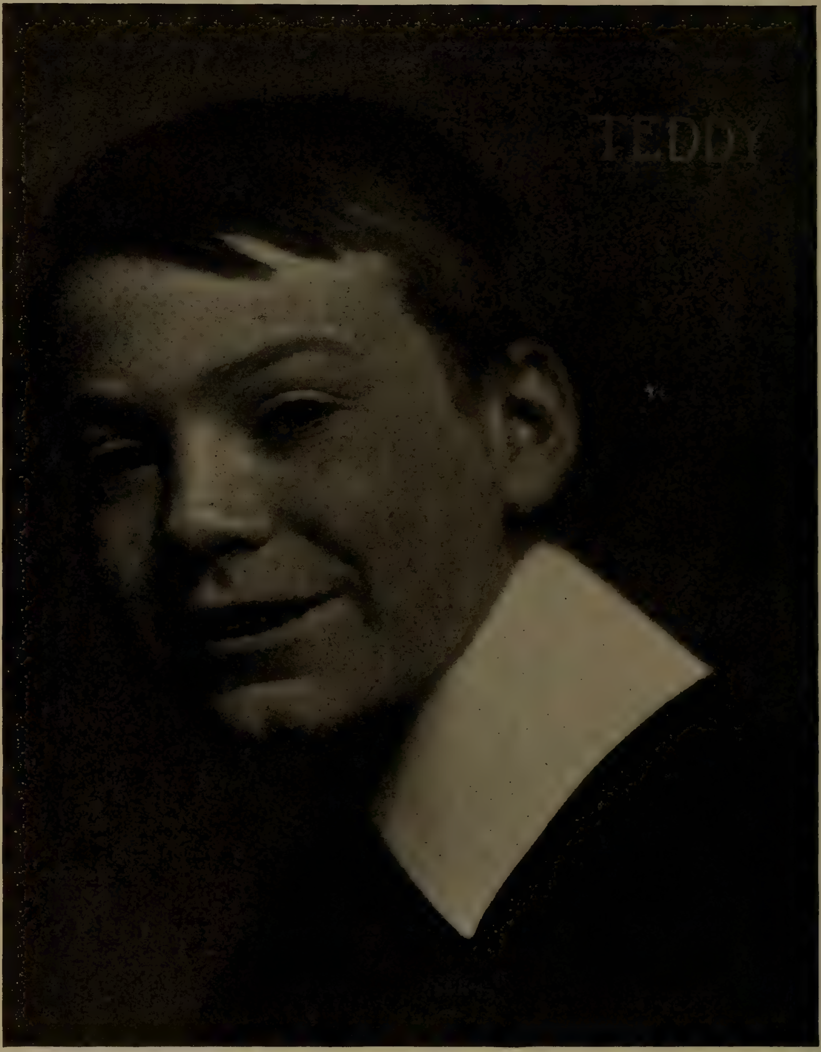
PLATE FINISHING

machines for the photo-engraver. Carefully and expertly constructed to give pleasing continuous service and the most practical advantages. Every operation provided for.

WRITE FOR PRINTED MATTER

JOHN ROYLE & SONS, PATERSON, N. J.
U. S. A.

Routers, Lining-Bevelers, Saws, Trimmers, Router Cutters, Etc.



"TEDDY"
By ARTHUR HAMMOND
BOSTON, MASS.

Smithsonian Institution
MAR 11 1920
National Museum

The
PHOTOGRAPHIC
JOURNAL
of AMERICA

VOLUME LVII MARCH, 1920 NUMBER 3

THE AUTHORITY FOR THE PROFESSIONAL PHOTOGRAPHER
PJA
FOUNDED 1864

CONSTRUCTIVE PORTRAITURE

By "PROFESSIONAL"

IN constructive portraiture the hands and arms serve their part toward concentrating the interest to the face, although frequently used in a different sense. In the three-quarter or full-length pose of the female figure especially, they are well employed in connection with the curves of the body or dress in forming the pleasing S line in composition—a great favorite with all on account of its beauty when successfully accomplished.

These members of the body are, however, used in many cases where they injure the composition, especially when they receive more than their proper quota of light, by not being properly subordinated to their proper position of attractiveness. We frequently see the arms of a lady extended out some distance from the figure, with a flower or something in the hand, or outstretched horizontally across a table or over a chair—a pose we all make at some time or other, often in compliance with the wish of a patron. If when we make these positions we also take pains to arrange the light so they will not be too high in key and less noticeable than the face, then such poses could be admissible, providing they be not strained in the effect produced. Certain other principles, however, are not to be violated. The background employed in such cases should be one that would assist you in your efforts to make them less conspicuous, so that no contrast would thus be permitted to nullify your efforts at subordination.

We mention that "other principles" may be violated by the positions of the hands and arms, and by inference stated that if this be the case, then the pose (unless corrected somewhat) could not be properly employed. This would especially occur if there be a breach in *rhythm* of line, or lack of *balance* in the composition, owing to the axis of the picture on account of the pose being deflected from the vertical. For this reason it is much more difficult to obtain *rhythm* in line and values, with a correct *balance* of the whole arrangement. More easily understood and obtained with a vertical axis, a departure to the oblique calls forth extra care and skill, but when successfully accomplished, it goes without saying that the student of photography has taken several decided advanced steps in the direction of art.

The members of the body, including the lower limbs, are best arranged, however, when their component parts are evolved *within the figure itself*, so that their protrusion would come within a reasonable distance of the figure itself; the whole composition in that case being made to conform in its entirety to some special pleasing form of arrangement. We all can conceive this to be possible, and the idea of the pose is saved by tempering it by subordination and conforming it to make a pleasing composition.

The writer recalls seeing recently a full-length seated portrait of a man with his legs stretched out almost horizontally, the object evidently being to give a careless pose, which in that sense was certainly a grand success. The man was short, and some attempts were made to lose the elongated effect by the subordination of the light, and yet even with these aids the pose was so atrocious without any general form of composition that it marred the other parts of the picture, some of which were very good. If not successful under these conditions, it is easy to imagine what it would otherwise be if it had not received the assistance it did in the lighting.

It is a pleasure to the writer to find beauties in the pictures made by the present-day photographers, which will encourage all of us, by noting the steps our contemporaries are taking. In pursuance of this policy for our mutual upbuilding, reference will from time to time be made to other pictures that come to our attention, in which certain effects are produced.

As a final word in closing, some suggestions as to the use of the hands, arms, and limbs of the body, we advise special attention be given to good reproductions of paintings, where such things have been treated. Meanwhile, keep the limbs always tied to the figure, and the figure to them. Don't let them go on an exploring expedition, but keep them at home.

Particular attention should be paid to the following suggestions:

1. The importance of becoming acquainted with the subject, to some extent at least, before commencing operations.

2. Originality, with its various forms as tending to give a noticeably marked individuality to the work, paying special attention while treating of this feature to the portrayal of the "character" or soul of the sitter, so that it be properly brought to the front as being most vital to our success as portraitists.

3. That some definite form of arrangement should always be the aim in composition, such as the circular, elliptical, various forms of the angular, S line, etc., or possibly some of these forms inside of others, viz.: the elliptical within some rectangular, etc. These forms should not be carried out so literally as to make them too apparent, thus giving undue attention to the design as being your scheme, but should rather be intuitively suggested than otherwise. It is well, also, to assist in keeping it ever prominently in mind, namely, that from "the moment we commence upon composition it will be found that every part of the work has a connecting link with every other, and that while performing one part a step is being taken toward another and probably equally as important principle in art," until at the end unity of the whole is accomplished. Of course, we all recognize this difficulty, although a much desired *desideratum*.

4. In "concentration of interest in the picture" we mentioned as aids the arrangement of lines, contrasts of light and dark, and subordination of less important things to their proper weight by attraction; the degree of success attained, especially on these last two points being measured by our ability to intelligently control the lighting to obtain this result.

Before leaving this section for other fields, it may be wise to more fully comment upon suggestions as to lines, contrasts, and subordination as aids to the concentration of interest in the picture, although they all play important parts in other principles not as yet mentioned in these papers.

To even partly appreciate the power

that lines possess in every form of composition, as well as their influence in determining and obtaining dignity, sweetness, and even every other form of expression, we should give it our closest study.

To thoroughly or even fairly well explain this in writing so as to give the average reader, who may not have bestowed much thought upon it, a comprehensive view of their importance, requires, unfortunately, a more subtle talent for analysis than the writer possesses. Whereas there is much that could be said which is comparatively easy of description, there is an esthetic sense in which the power of lines is of value, which is felt intuitively by the average man, but not tangibly enough for explanation.

We all know that lines, on account of location, size, and shape, play an important part in giving solidity, ruggedness, delicacy, beauty, etc. These are more readily understood, as they are very apparent in a picture. When we consider that there is nothing having form or shape, taken either as a whole or in part, which is not composed to almost a confusing extent of lines of some sort, their great importance in shaping the destinyof a work of art can in a measure be realized.

The extent to which most photographers give attention to lines consists mainly in the arrangement of a lady's dress so that they may conform to some of the graceful lines noticed in the well-formed nude female figure. Hogarth's favorite line of beauty, described by him in his essay, is the line of a woman's back, as shown in profile from the neck to the thigh, and this line is more or less followed—often even more sweeping in its course—by the majority of artists and photographers in female pieces.

Poore, in his excellent work, *Pictorial Composition*, speaking of this line of beauty, says: "It is particularly adapted to upright arrangements, and one largely used by the old masters. We are able to trace this curvilinear feeling through at least one-third of the Renaissance." . . . "Over and over again Rubens has repeated this general form, and always with good effect. Whether the line is traceable upon the vertical plane or carries the eye into the picture and forms itself into the graceful union of one object with another, its great pictorial power is revealed to any who will look for it." Again: "If two (of these lines) be joined side by side, they produce the beautiful curve of a mouth and the cupid's bow. Horizontally, the line becomes a very serviceable one in landscape." . . . "The compound curve which this line contains is one of perfect balance, traceable in the standing figure."

When the decorative line is employed, it should always be the main line in the composition, all others being of far less prominence, and mostly employed either to give it beauty or force, as a subtle aid to its continuance, or to give balance to the composition. It is a mistake to have two equally important lines, thus causing a diversion of interest with a resultant great loss to the desired effect. When, as sometimes seen, these equally important lines are antagonistic to each other the effect is as jarring to comfort of mind as would be the case if your cat and my cat were to meet each other on our doorstep on a frosty night.

The continuance of this major decorative line through the figure by the arrangement of the skirt, properly placed arms, curve of the shoulder and neck, bend of the head, and often carried *over* the head by the line of the lady's hat until lost on the other side of the head, makes the harmony and extends Hogarth's line to the "S" line, which thus in turn becomes the principal line in composition.

PHOTOGRAPHING UPON WOOD FOR ENGRAVING PURPOSES

By ALFRED J. JARMAN

Part I

VARIOUS descriptions have been given from time to time for making photographs upon wood, for use by the engraver, by preparing a boxwood block with a sensitive material to be used in a dry state, necessitating the use of a special printing frame with screw adjustments. This method of working is past and gone, except in a very few instances where time is no object.

Today, however, such a process is by far too slow for commercial work, when a print must be made and finished in thirty or forty minutes, at the most, ready for the engraver, including setting up the object and making the negative. The process here described is known as the wet process, the negative being made by the wet collodion process in every instance, no prism being used to secure a reversed negative.

It is necessary, in the beginning, to have the glass plates *thoroughly* clean, for upon this depends the success of making good negatives.

Preparing the Glass Plates

Discarded dry plate negatives answer the purpose well, the gelatin film being removed by soaking the negatives in two gallons of boiling water, in which about a pound and a half of common washing soda has been dissolved. Placing each plate into the boiling liquid separately, gelatin face downward, will prevent them from sticking tightly together.

As soon as the liquid has cooled down so as to enable the plates to be handled, they may be wiped with a rag mop, to clean the surface completely of the gelatin, then rinsed under the faucet and placed in a stoneware crock, containing a solution of nitric acid, one pound of nitric acid to two gallons of water. They must now be taken and scrubbed upon a clean board with a clean nailbrush, under a stream of running water, then held up to the light so as to ascertain which face is faintly hollow or concave. Then upon this face is poured a mixture of albumen made as follows:

Albumen of one egg	
Ordinary tap water	2 qts.

The albumen must be first cut up well with a rotary egg beater, and one dram of strong water ammonia added. This ammonia is added to the two quarts of water, shaken up well, and a portion of this filtered into an eight- or ten-ounce graduate.

As soon as the glass plate is drained, by holding it cornerwise for a second or two, this weak albumen solution is poured upon the wet plate, then drained into the graduate from which it was poured by touching the inside of the graduate at one corner so as to prevent air bubbles being formed. The plate is then placed in a clean rack to dry, the albumenized surface being always placed one way, so as to know which face has been prepared. When they are dry they are quickly collected and placed upon a shelf ready for use, with the albumenized face to the wall. All plates must be prepared in this manner, which takes less time to prepare than to describe. The writer always prepares a stock of these plates, either at night or at times when work is slack, in sizes of 3¼ x 4¼, 4 x 5, 5 x 7, 6½ x 8½, 8 x 10 and 10 x 12.

The object of the albumenizing of the plates is to enable the collodion to hold firmly to the glass through the various operations until the time for stripping arrives.

Preparing the Iodized Collodion

The collodion best suited for this class of work is given in the following formula. No bromides are used, because a contrasty negative is required with transparent lines down to clear glass.

Sulphuric ether (sp. gr. 720)	10 fl. oz.
Pure alcohol (photographic) .	10 fl. oz.
Ammonium iodide . . .	70 gr.
Cadmium iodide	40 gr.

Shake this mixture well until the salts are dissolved, then add

Pyroxylin (negative cotton) . 120 gr.

(This quantity of soluble cotton gives a little more body to the collodion, which is necessary for the class of work to be done.) Shake the mixture well half a dozen times or more during the daytime, then let it stand for two or three days, when the clear portion may be decanted for use. When using collodion the best kind of bottle to use is known as a collodion pourer, which consists of a glass bottle with a glass lip protruding about one inch above the top, ground to fit, with a slot in the side, while the cover consists of an outer vessel the size of a small tumbler fitting over the glass lip, and so ground that it forms a spirit-tight cap over the lip as well as the top of the bottle. Such a bottle prevents the escape of ether and ensures a clean lip to pour the collodion from, free from dried chips of collodion, which will always produce a streak upon the sensitive plate and consequently a defective negative.

In the absence of such a bottle a six-ounce or eight-ounce clean-glass bottle may be used, with a domed top. This will assure an unobstructed flow of collodion. This bottle must be kept well corked when not in use.

The Nitrate of Silver Bath

Distilled water	60 fl. oz.
Recrystallized nitrate of silver	5 av. oz.

This solution should be made in a three-quart clear-glass bottle, and shaken until the crystals of nitrate of silver are dissolved, which will indicate about thirty-eight upon an argentometer, meaning thirty-eight grains to the ounce.

Acid Nitrate of Silver

Distilled water	2 fl. oz.
Nitrate of silver	1 dram
Nitric acid, C.P.	2 fl. oz.

This solution must be kept in a glass-stoppered bottle. Shake this until the nitrate of silver crystals have dissolved, then add one and a half drams by accurate measure to the above nitrate of silver solution. The writer has always found this plan of adding nitric acid to the silver bath to be the most certain in result as an acidifier. The solution may now be filtered through absorbent cotton and poured into the vertical glass bottle. A glass plate 6½ x 8½ must now be coated with the iodized collodion and placed in the bath while resting upon the dipper and allowed to remain over night.

This will add to the solution the necessary quantity of iodide to make it in good working condition. The plate must now be removed, rinsed under the faucet and placed into the nitric acid cleaning crock until required for cleaning off, where all used or defective negatives must be placed to loosen the collodion films that remain, so as to enable them to be scrubbed off easily when the time comes for plate cleaning.

Collodionizing the Plate

Take one of the albumenized plates, hold it by the top corner nearest the body; pour upon the middle a pool of iodized collodion; allow this to flow, first, near the corner being held; then, by slight tilting, it will flow to the next top corner; then down the off side; then drain carefully from the remaining corner into the bottle it was poured from; rock the plate to and fro almost at right angles, so as to prevent any run marks upon the surface; touch off the thick drop of collodion from the run-off corner; place the plate upon the dipper and lower it at one stroke direct into the nitrate-of-silver bath. Of course, these operations must be conducted in the dark-room under an orange-colored light. For wet collodion work this kind of illumination is better than ruby, because every operation is better seen and is perfectly safe as a non-actinic light for this class of work. The plate will be perfectly sensitized in the course of two or three minutes. It must, however, be moved up and down in the bath a few times to rid the surface of ether and alcohol, when it may be drained from one corner into the bath, then placed into the dark slide or plate holder, and the back of the slide placed in ready for exposure.

In this branch of photography the arc electric light is invariably employed, because daylight is too uncertain. The writer uses two arc lamps, one on each side of the copy or object, 3000 candle-power each and 110 volt circuit, and an anastigmat lens. The time of exposure (according to size of stop) is anything from five seconds to one minute.

As soon as the exposure is made, development is carried out by an acid iron developer.

To prepare the above the following stock solution must be made ready for use, in an open, wide-mouth glass bottle and labelled—

Stock Iron Solution

In a one- or two-gallon, tall stoneware crock, filled three parts full of warm ordinary water from the faucet, suspend in this water a four-fold cheesecloth bag containing three or four pounds of *protosulphate of iron*. Always keep some of this salt in the bag so as to ensure a *saturated solution*. The bag will retain any chips or other coarse impurities. When no more crystals dissolve from the bag, remove it and place it in a tray for a short time until the solution in the crock has been stirred to secure uniformity. Then pour this into the wide-mouth glass bottle, return the bag filled with crystals to procure another lot of saturated solution. No particular care is required to cover or cork these vessels, because when they become a little red or rusty they are then in the best condition for developer making.

Preparing the Iron Developer

In a separate bottle, labelled, "Iron Developer," place the following:

Saturated iron solution . .	16 fl. oz.
Ordinary tap water . . .	16 fl. oz.
Glacial acetic acid . . .	3 fl. oz.
Wood alcohol (absolute) .	1 fl. oz.

Shake this mixture well, when it will be ready for use. It will keep well for two or three weeks and may be used with certainty any time during this period.

Developing the Wet Plate

As soon as the exposure has been made, developing is carried out by pouring a small quantity of the above developer upon the *surface*, so as not to allow it to flow off the plate, being poured from the tip of a four- or eight-ounce graduate, carefully and rapidly from the side, or lower end of the plate. Then, by rocking the plate slightly, the image will appear in about four or five seconds, and be complete in ten or twelve seconds, when a plate 4 x 5 or 5 x 7 is employed.

The moment the development is complete, the developer must be washed off the plate by placing it in a gentle stream of water from the faucet. Washing will be complete in about ten or twelve seconds (quite unlike the making of a dry gelatin plate), the back of the plate being rinsed under the faucet at the same time. The negative is fixed by placing it in a tray containing a solution of cyanide of sodium, or by pouring upon the wet surface either of the following fixing solutions:

Fixing Solutions for Wet Collodion Negatives

Cyanide of sodium or potassium	2 av. oz.
Ordinary tap water . . .	32 fl. oz.

If either of the above cyanides used is the 90 per cent. kind, then forty-eight ounces of water must be used. Hyposulphite of soda may also be used as a fixing agent made in the following proportion:

Ordinary tap water . . .	32 fl. oz.
Hyposulphite of soda . .	8 av. oz.

Either of the above fixing solutions is thoroughly effective. When the hypo bath is used a longer washing of the plate is necessary.

As soon as fixation is complete, which in the cyanide solution is very rapid, about ten to fifteen seconds, washing the plate must take place at once. Upon examining the negative by transmitted light of the orange lamp a beautiful, clean and clear, apparently weak picture will result; but by reflected light, with a dark background, a decided positive will present itself. The negative now must be intensified so as to produce a very contrasty picture, suited for printing upon the wood block, while the negative is still in a wet condition.

The following intensifier has proved to be, in the writer's practice, the best for this class of work. There are several others that may be used. The writer has found from daily practice that no other intensifier answers the purpose so well, uniformly and economically as the one here given. A little care must be exercised in its preparation, and it must be borne in mind that both the cyanide solution and the intensifying solutions are poisonous, and must be labelled such.

Formula for Intensifying Solution

A

Bichloride of mercury . .	1 av. oz.
Chloride of ammonium . .	½ av. oz.
Water (ordinary)	6 fl. oz.

Shake this mixture well until the salts are dissolved in a wide-mouth, clear-glass, twenty-ounce bottle.

B

Potassium iodide	1 av. oz.
Water (filtered)	10 fl. oz.

Shake the solution until the potassium iodide is dissolved, then add three or four fluidounces of this to the mercury solution A, stirring with a glass rod vigorously. A scarlet heavy deposit of biniodide of mercury will result. Now add a few drops at a time of the B solution, until, while stirring, no more red precipitate is formed. Care is required here, because if too much iodide solution is added the scarlet iodide will become dissolved, producing a useless mixture. As soon as no precipitate is formed by the addition of a few drops of the B solution, shake the mixture well and let the scarlet biniodide settle. This will require about one hour. Meantime, in a separate vessel, dissolve about two ounces of hyposulphite of soda. At the expiration of this time, pour off the clear solution of the biniodide into the sink; add six ounces of clean water; then, while stirring the precipitate with a glass rod, add, a little at a time, some of the hypo sulution. This operation must be done with caution. Continue to add the hypo, a little at a time, until the scarlet precipitate is *nearly* dissolved. The solution will then be ready for use.

Pour six or eight fluidounces of this into an enamelled, porcelain, or glass tray; then insert the negative while wet; cover the tray with a piece of waterproof cardboard or a wooden board, to protect the solution from the action of light and to keep out dust. In the course of a few minutes the collodion film will turn to a gray-greenish color. Now remove it, wash well under the faucet, and pour upon the surface a solution made as follows:

BLACKENING SOLUTION

Sodium sulphide	3 av. oz.
Water (ordinary)	32 fl. oz.

This solution may be poured on the plate and the excess drained into the small wide-mouth bottle it was poured from, as it may be used over and over again.

The negative must now be well washed under the faucet, when upon examination it will be found that a black intensity has been produced, with perfectly clear glass in the shadows.

If the density or opacity of the picture is not sufficient, the negative must be returned to the mercury solution, allowed to stand for several minutes, when, upon examination, it will be found to have gained sufficient density. If not, then one more flowing of the sulphide solution will complete the operation, when the negative may be placed in a rack to dry.

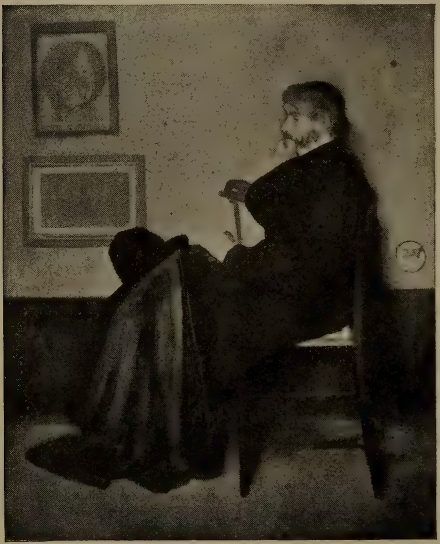
The mercury solution must be poured into a wide-mouth bottle at the end of the day to become clear, the tray washed and wiped, ready for the next day's use.

ON SITTING POSITIONS

By SIDNEY ALLAN

IT has been observed that the full profile view does not lend itself particularly well to standing positions. This does not hold good with sitting positions. They somehow find their most favorable expression in a clear profile from the forehead to the tip of the shoe.

It is not a mere coincidence that James McNeil Whistler painted his two masterpieces of portraiture, his "Mother," at the Luxemburg Galleries, and his "Carlyle," which we reproduce, as profile views. A seated figure is generally a jumble of lines. Treated in profile, the lines become simplified. Only one arm is seen in its entire length, and the lines of the legs can be more easily managed.

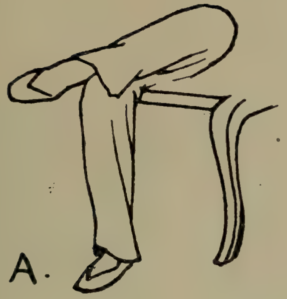


"CARLYLE" BY WHISTLER

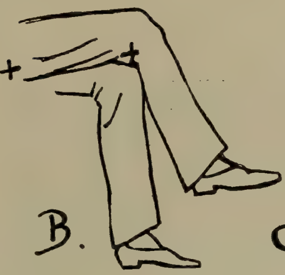
The great difficulty of depicting a man seated is caused by his legs. It is almost impossible to make these two pieces of stovepiping fall into graceful lines. And comparatively few sitters take enough exercise to keep their limbs supple enough to assist the operator by placing them in graceful positions. When a man sits in a chair, after a time he feels inclined to rest one leg by crossing it over the other. This helps considerably to get rid of the two parallel lines formed by the lower ends of the trousers. The two most natural ways of resting one leg on the other are shown in the diagram. *A* is, no doubt, a graceful position, but it is only suited to a certain type of "young and stylish" men, and does not lend itself particularly well to photographic portraiture. The lower part of the picture is generally dark, and this (unless very skilfully handled) will result in one leg, the one touching the floor, being almost lost in tonal darkness, while the other, by the nature of its position, will receive an undue share of light, and easily look out of proportion. *B* is by far the most common pose. Everybody assumes it. Some photographers think it objectionable, because it often makes such a long straight line from *X* to *X*. By getting the sitter to cross the outer leg over the nearer one (*C*), this line is got rid of; but this position, on account of its foreshortenings, is much more difficult to take. And, after all, the other can be managed successfully, as we see in the portrait of Whitelaw Reid.

To return to the full profile view. I would like to draw special attention to the "Carlyle." It is a most formidable object lesson. No better picture could grace the walls of any studio. The majority of photographers have fallen into the error of looking at the Old Masters for inspiration. A few pictures of Whistler, Alexander, Sargent, Zorn, Lenbach, Bonnat, contain more instructive qualities for the up-to-date photographer than all the Old Masters that can be found in European galleries.

Notice how sure, simple, and well-balanced the composition of the Carlyle is; how all the details of dress have been eliminated; how the outline has been accentuated against the background; how naturally the figure is seated, and how well it has been placed in space.



A.



B.

C.

There is an atmosphere around the figure. One feels that this person is seated in a room. How few photographs can carry out the atmospheric effect! (The gloved hand resting on the cane is a trifle too dark, but that is only the case in the reproduction; in the original the color value of the glove tells beautifully.)

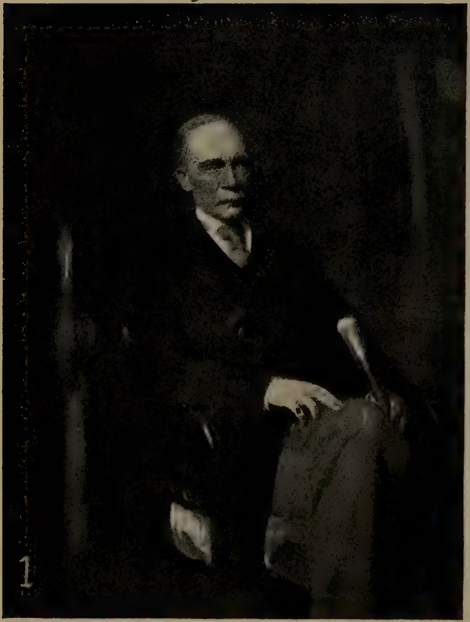
A seated person in profile looks contemplative, unconcerned, isolated, as it were. Looking straight ahead, the person seems to live in a world by himself. The aspect is a trifle stern. But, for a serious portrait of an old man or woman, or a personality of prominence, no better viewpoint can be found. It is simple, dignified, and decorative at the same time.

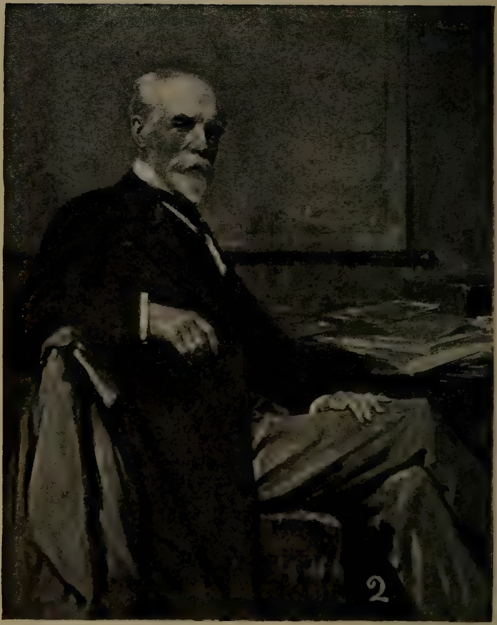
The other views have a more picturesque tendency. In Fig. 2 we have the body in profile and the face in three-quarter. This view is one of the most satisfactory ones. The simplicity in the handling of the body is preserved, while the face turned toward us has a more sympathetic, cheerful expression.

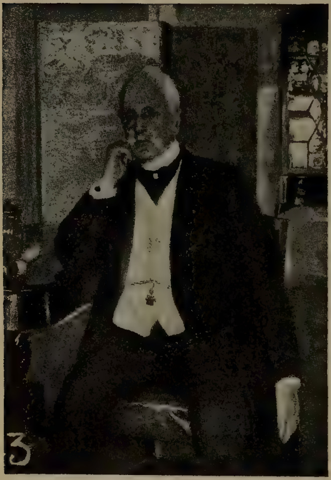
Fig. 1 gives us a full three-quarter view. It has the charm of being more pictorial. The lines are softer and have more swing to them. It is the ideal position for women. The lines of the skirts flow more gracefully (particularly so if the gown has a train) in this position than any other. It affords a wonderful opportunity for diagonal line arrangement.

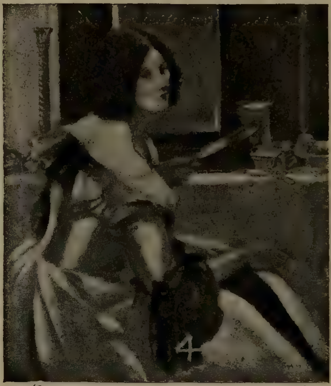
Figs. 3, 5, and the famous portrait of Whistler, by Boldini, show us the full front view. The simple full front view, the legs straight down, as exemplified by the MacMonnies portrait (Fig. 3), is always a trifle bulky and awkward. There is too much symmetry and too many parallel lines. This can only be improved upon by special lighting, as we see in Fig. 5 (by the by, not quite a full front view), or by placing the arms in such a way (viz., the same portrait) as to break the symmetry. If the arm of this lady were hanging down, as in the MacMonnies portrait, the composition would suffer and the portrait would look rather commonplace. A still more effective way than the mere shifting of the arms is to give the entire body a peculiar twist or swing. This Boldini accomplished in his portrait of Whistler. This portrait competes in excellence with that of Whistler's "Carlyle." It is picturesque in the extreme, almost too much so. One thing is sure: If you ever succeed in placing a sitter in a similar position, you will have one of the most successful pictures you ever made. But I fear you will have to wait until a person comes to your studio and assumes such a position naturally by his or her own free will. One cannot force people to look picturesque. It would prove a dire failure. The Boldini portrait, however, shows that the general awkwardness of the full front view can be overcome, and to the photographer who sees and thinks it will suggest an endless variety of new poses. The difference between the Boldini and MacMonnies portraits is too startling to be overlooked. Both are natural, but one is prosaic, ordinary, while the other one is interesting and full of animation and life.

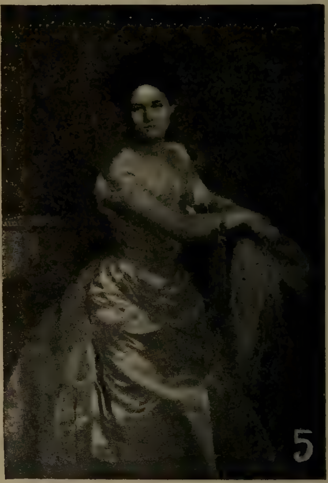
There is still another view, which in itself is more picturesque than any other. It is the three-quarter back view, with the face looking over the shoulder. It is specially suitable for women, and always sure of a pictorial effect.











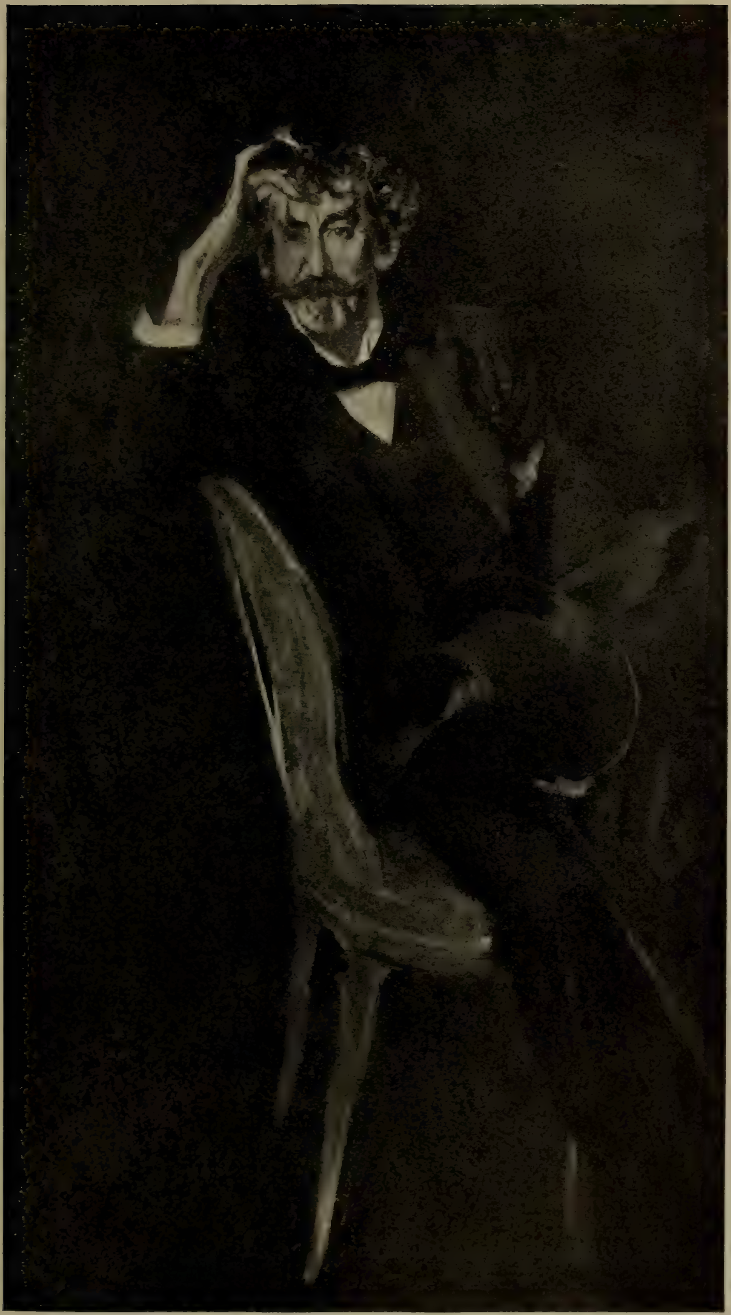
"THE SILVER MIRROR"
BY W. GRAHAM ROBERTSON

"GEORG VON BUNSEN"
BY RHEINHOLD LEPSIUS

"HON. WHITELAW REID"
BY SIR GEORGE REID

PORTRAIT
BY MACMONNIES

"MLLE. CREMER"
BY EMILE WAUTERS

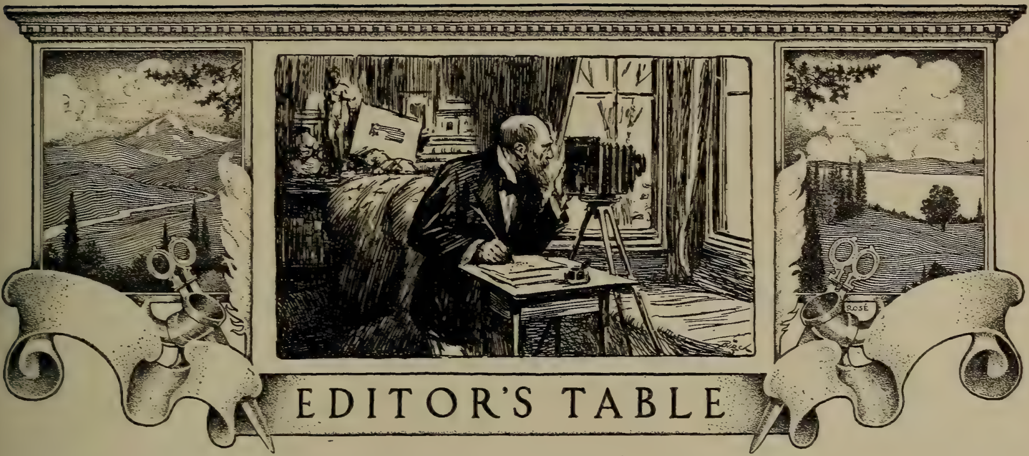


"WHISTLER"
BY BOLDINI

Before I conclude I would like to talk a few minutes about the most necessary adjunct of all sitting positions, namely, the chair. It is the real stumbling block in the majority of unsuccessful portraits of this kind, and there are few photographers who could not tell their own tale of woe about this most obtrusive and unwieldy piece of furniture. In appalling distinctness, its arms and legs appear always where they are least wanted. One might almost suppose that an ordinary piano stool would prove the best vehicle to overcome all these difficulties. But, after all, there must be some visible support to a seated person (depicted in full length), and it would be impossible to manage the backs and arms of the sitters without the backs and arms of the chairs. So there you are. The chair is a necessary evil. But I really do not understand why those huge carved monstrosities of studio armchairs, with a back twice as high as that of any chair in ordinary use, have ever come in vogue. They mean death to any portrait with artistic pretensions, and the photographers who patronize them are in misery indeed—and by their own doings.

My advice is to show the chair as much in profile as possible, as in the Whistler and Boldini portrait. It does away with the confusing perspective of the legs. Of course, you can subdue it, as in Fig. 1, or disguise it with drapery, as in Fig. 2. But one means extra work, and the other somehow never looks right. People don't drape their chairs in ordinary life; why, then, should it be done in portraiture?

Much trouble could be avoided by selecting simple, graceful, fashionable chairs, such as are used in everyday life. Their lines must mean something in the general composition, and as much care should be bestowed upon their arrangement as on the arms and hands and legs of the sitters. And why must it always be a chair? A settee, a sofa, will yield in many instances much finer opportunities than the stiff and awkward studio chairs.



THE KEY TO BUSINESS SUCCESS

THE business of a photographer, like that of any other professional man, will be in direct ratio to his capacity for adapting himself to the commercial methods and practices of the times. The professional element in his work has rather made against him in this. Like the druggist, with his professionalism, he has been inclined to overrate its value, take a stand upon a slightly higher plane than the purely commercial one, and been handicapped commercially in consequence. Marked professional capacity, of course, deserves special pay and the higher stand. But it is far safer for a man to assume the possession of average merit, attainable by an average man, and thrust himself boldly into the commercial ranks, for the certain reward he will find in them if he will but work wisely as well as diligently.

What form and complexion the wisdom takes, can be best judged by studying the chief causes of the success of well-known buisness men who have come to the front. There is not one who has not found advertising the main central supporting pillar of the superstructure of his fortunes. And advertising upon the most liberal possible scale that his returns would allow of. "But advertising is expensive work." So it is, yet not so expensive as when the men in question boldly risked their all in support of their faith in its value—and were amply justified by results. A man may have to spend $100 to make a profit of $50, but it is a wise expenditure, for the $50 would not otherwise be gained.

Photographers, upon the whole, advertise very little. Where they do, they follow in the ordinary grooves so littered with newspapers and handbills containing the particulars of the wares of their fellow tradesmen, that the description of their own is heedlessly passed over by a tired and satiated public. At the same time, the photographer has in his possession the very best means of gaining, and that with the greatest ease, the admittedly strongest, most profitably, and so, naturally, the most diligently sought-for feature in advertising, viz., novelty. Take a case or two in illustration. Every town has some characteristic, something in the way of a bridge, a river, a church, a pier, a promenade. A photograph of it should be taken, and reproduced in a small block. Prints from this upon one side of an artistic card, the other being devoted to a statement of work and prices, would form a very effective advertisement. It would not be tossed aside like an ordinary handbill but kept with more or less care. Snapshots of interesting local events suggest themselves as still more interesting material for such treatment.

Another marked and essential feature of successful advertising is continuity. Spasmodic efforts, however good in themselves, lose force from their occasional character. With a little thinking a photographer could express pictorially an idea requiring several pictures—the park, pier, or river in spring, summer, autumn, and winter, the chief open-air functions of the town or city's year, and so on. There are a hundred different ways in which a sharp and thoughtful man can elaborate novelties, either for distribution or exhibition in his window and show-cases. They would serve to keep his name before a pleased public, and he would not form an exception to the rule of the result, meaning money gain. It certainly means trouble and work, but he who thinks that success, even with the very highest capacity, in business or anything else is to be gained without these, had better, perhaps, begin calculating what sized wings would lift him. He is fitted for higher than earthly spheres.

There has been much grumbling at the high prices to which work has been produced. It is natural enough perhaps; but, looking around, it will at once be seen that the raising is not confined to photographers. It is general and characteristic of all business, wholesale and retail, all over the world. It may be further noted that some, recognizing the trend of things and its inevitableness, instead of grumbling at, cheerfully accept the new order and method of doing business, and are making money. They find that if prices are higher there are more customers, and also—a fact that is too often lost sight of in complaining—that they are themselves benefited by the same raising of prices in every direction.

In the references to the value of persistent and novel advertising, and in adapting prices to the demands of the times, we do not by any means assume to have exhausted the elements of success; but if these two most important be gone in for as a start, it will easily and naturally follow. He cannot be progressive in one direction only. The show-cases will be brightened up and rearranged, the studio repainted, old backgrounds discarded and replaced by something fresher looking and more novel, new processes and new ideas generally adopted wherever possible.

If so, it is quite certain that work will tumble in more plentifully, and although the profits on the individual card may be smaller, in gross at the end of the year there will be a pleasing increase, but always in strict proportion to the extent of energy and progressiveness displayed. When profits increase—"Ah, well, there are many worse businesses after all than a photographer's."

PRACTICAL PAPERS ON STUDIO WORK AND METHODS

The Business Receptionist

The receptionist in any studio is usually a busy person; there are always multitudes of small things to be attended to—things it does not do to forget, but which run away with valuable time to an alarming extent. Moreover, no matter how harassed or pressed for time she is, no client can be hurried, nor must any trace of haste appear in her manner—that would be bad business. Yet the receptionist is always expected to do her utmost to increase the turnover of the business by what are sometimes rather loosely termed "sidelines," such, for instance, as the sale of enlargements, miniatures, and colored work generally; and, indeed, it is to her advantage to do so, as in most studios the receptionist receives a commission, additional to her salary, on such sales.

Photography, as we all know, is supposed to be an artistic business, and perhaps it is for this reason that in so many studios ordinary business methods, as used in offices, etc., are markedly absent. Yet the skilful use of some of them—or, at any rate, the adapting of them to studio conditions—might do a good deal toward lightening the receptionist's burdens, and giving her more time to devote to the increasing of the photographer's receipts.

Some of these things, by being systematic and methodical, she can do for herself; in others the owner of the studio must help her out, with the necessary apparatus, etc.

In many studios the receptionist does some at least of the colored work in such spare time as she may have, or else suggests which specimens, if colored, might be likely sellers.

Now, I suggest that both time and alterations might be saved in this matter by the use of a coloring book, kept by the receptionist for her own and the colorist's use. Whenever a sitter came, of whom in the receptionist's judgment a colored miniature, etc., might be made, she should note in a few swift glances the general color of eyes, hair, complexion, clothing, etc., and, directly the client is gone, note these down, with any special details, such as textures of materials, ornaments, etc., in an alphabet book kept by the receptionist for that purpose. This is invaluable, for it is no more difficult in coloring a photograph to make the coloring accurate than to do it by judgment or guesswork, and where the colored specimen or miniature is bought it will save many alterations, which are bothersome, difficult, and often not quite satisfactory. Many colors of dress materials, etc., photograph pretty much of the same tone, and if the colorist puts in a dress of purple velvet, when it was a green or brown, it involves a considerable waste of time and temper to alter it. Sometimes, too, such a book of colorings will furnish a most useful guide several years later, if, for instance, miniatures or colored enlargements are desired of some sitter since deceased, where otherwise the colorist must go by guesswork. In noting colorings she will almost unconsciously form a standard of judgment which will assist her much and enable her to be surprisingly accurate in her coloring.

Now, when enlargements and miniatures are submitted to customers in the hope of their purchasing them, a letter must, of course, go with them, which usually the receptionist writes on behalf of the owner of the studio. The busier the season of the year the more letters of this kind there always are to write, as, for instance, at Christmas. It means orders and money, of course, but it also adds to the work and strain of the receptionist at a time when she can ill spare the time.

Most studios are now equipped with a typewriter, and the fortunate receptionist can jot down notes in shorthand, too, saving much labor. But usually photographers stop at the typewriter, why I don't know. In conjunction with it some form of duplicating apparatus ought to be used. Then, in some slack hour, the receptionist could, at her leisure, draft out a good and telling letter, forcefully put, to go with these approval specimens. This would then be typed and a carefully cut stencil made on the typewriter. Then one of the most careful of the junior assistants could be set to run off fifty or a hundred or more copies of this letter on the duplicating machine, and thus the receptionist would be set up with well-written letters, ready to send, needing only the addition of date, name and address.

Some photographers always circularize their customers at certain times of the year, as before Christmas, Easter, etc., to remind them of the timeliness of photographs as gifts, etc., the pleasure given by family groups at the season when families are most often reunited, and so on. Printed matter is often used, but frequently a better effect might be produced by typewritten matter, duplicated, and with each name and address inserted. It takes a little longer, but it has the more personal note, and that tells in so personal a business as photography. Moreover, if it is planned by the receptionist, it should bear no evidence of this, but seem to come quite straight from the photographer himself. Then, again, once a photograph is submitted on approval some method is needed of keeping check of the time it has been out, and, if necessary, the posting of a second form letter to remind the customer of the specimen. In no case should more than ten days or a fortnight pass before the sending of a second letter, which also can be a duplicate form letter, skilfully written. All this saves the receptionist much worry and writing, and if a commercial "tickler" system is used, and when entering date of sending out on the card the date for the second letter is also noted on its own card, in advance, at the appointed time this automatic reminder pops up and does its work, and few or no items will ever be overlooked, while much needless strain on the memory is saved and better results attained.

I might here mention another thing. It is often profitable to make a note of casual remarks by customers. If, for instance, a lady remarks how she admires those sep'a enlargements, why, note it down, and, when having one made look it up and submit her one in sepia. It is much more likely to sell. Another will say that he or she does not like enlargements—clearly a case for a miniature; while yet again another will say that he does not like colored photographs—a clear case for a monochrome enlargement.

It is just such little remarks as these and such notes of them that will prevent unsold specimens lying on hand, when the photographer would much rather have the cheque for them to pay into the bank. In these matters the operator can often greatly help the receptionist by passing on to her any such comments to be noted down, or, better still, doing it for her before it can be forgotten. Usually the receptionist sees all sitters; if not, the operator could easily note for her the details of coloring, etc.

The net result will be an increase to the coffers of the photographer and more commission for the receptionist, with less worry and bother, and, incidentally, well-satisfied customers.—G. E. H. G., in *B. J.*

Studio System

To the man who is not versed in business methods a business system that is comprehensive, no matter how simple, seems at first to be complicated. This is because examples meant to explain are to you but problems. Once you have adopted and applied a system to your business you have a new interest in figures. They represent money coming into your pocket on one side of the page and going out of your pocket on the other.

Business system at once becomes a fascinating game in which you win or lose, and as you can see every move—in fact as you play both sides of the board yourself, you soon learn how you must play the cash receipts to counter the expenses and win the game with a profit.

I know a man who can tell you about anything you want to know about any ball club in the country during the baseball season, and if you throw him into reverse he can tell you just how much his November business gained over November of last year, how much additional it costs him for stock and overhead and how much of a gain he had made in profits.

I hear someone say, "What's the use? If business is good, we make money; if it isn't, we don't. So much money comes in; so much goes out, and the difference is profit. Bookkeeping is hard work and it doesn't bring you any more business."

Suppose you had a job which paid you $2000 per year, and you had $5000 in a perfectly safe investment which paid you $300 interest per year; you would be making $2300 per year, wouldn't you?

Someone induces you to invest that $5000 in a photographic business. It looks good, but, since this is only an illustration, we will say it barely pays you $2000 a year profit for ten years. Just what have you lost?

First of all, you have lost that $300 per year interest that you once had from your safe investment. But you say you still have your studio. You are asked to take an inventory with a view of selling the business, and you find you have to stretch things a bit to make the place worth $2500. You have lost $2500 on depreciation and $300 a year or $3000 interest, so you have a total loss for the ten years of $5500.

Such things have happened, but not when you have a good business system and make it work. Suppose you go over this again with a business system working properly. You have an inventory which shows the place is worth $5000. You run the business for six months and take another inventory. You charge up $150 interest on the money you have invested in your business. And you allow 5 per cent. for depreciation, figuring 10 per cent. a year, which gives you another expense item of $250 and which allows you to spend that amount every six months to keep the value of your investment up to $5000.

You use these and other items of expense, including your salary of about $40 per week, to figure the cost of producing your pictures. And you find that in those three months you have actually lost $137.50. Your pencil gets busy, and you find that if you go on at this rate you will lose an amount equal to your entire investment in ten years.

What do you do?

You get a new style for that popular cabinet-size picture and begin making it 4 x 6. And instead of selling it at $6, which you have found is actual cost. or a little under, you find that it actually costs you $6.37 in the larger size; so to make a profit of 25 per cent. you sell it for $8.50. You make similar changes in other styles and by the end of the year you find you have a certain, fair profit. And at the end of ten years your studio is worth more than what you paid for it and you have done better than working on a salary.

If you do not have an adequate studio system that will keep you informed as to the actual condition of your business at all times, send for the booklet: *System for the Photographic Stydio.* If it seems complicated, don't let that worry you. It isn't. It's a game, and there never was a game that required a little brain work that didn't seem complicated the first time you played it. One thing is sure: You can't learn a thing until you practice it, and this studio system can be mastered in a short time by yourself or your receptionist.

Success depends upon knowing your business. —*Photo Digest.*

Natural Poses of the Figure

Posing the human figure so as to give results which are satisfactory to the cultivated eye is not an easy matter—in fact, some photographers who lack the necessary quickness of perception never acquire the art at all, but content themselves with half a dozen stock positions and rest content with them. Others, however, feel the necessity for natural and pleasing arrangements, and often feel discouraged through their inability to induce graceful poses with unpromising subjects. To such I would try to give comfort, by pointing out the laborious work often lasting for years which the painter has to endure before he acquires proficiency in figure drawing. The photographer is distinctly better off, for he has not to go through the pains of learning to draw, but can concentrate his attention on learning what constitutes a graceful pose, and, what is equally important, recognizing one when he sees it.

There is no better way of acquiring a knowledge of posing than by studying paintings and drawings by good artists, not with the idea of copying the pictures closely, but rather of absorbing their spirit and acquiring what many people imagine to be "the artistic instinct," but which is really the result of cultivating such natural taste as the student originally had in his nature.

It must be conceded that the style and individuality of the model are important factors in the production of a picture. For example, it is useless to try to realize a conception which depends on a tall and graceful figure if the model is short and plump; here another pose which will not emphasize the undesirable characteristics must be chosen.

Nothing is so dangerous as to give positive rules for obtaining artistic poses, but generally it is desirable to avoid either full front or profile views of the figure as these lack animation and produce the undesired impression that the sitter is standing for the express purpose of being photographed. Another thing to be avoided is any attempt to manipulate the sitter into a graceful pose. This is rarely successful, the sitter either appearing stiff and constrained in the attempt to keep a position which is not natural to her, or assuming an expression of boredom and fatigue which will nullify the effect of the most perfect pose. I well remember one very skilful photographer who treated his sitters as if they were clay models. The hands and arms were carefully placed, and every fold in the drapery carefully disposed, but by the time the exposure was made the sitter was on the verge of collapse and looked it. Far better than this is to observe closely every movement of the sitter while in the studio before any attempt at posing is made, and to choose any position which she may take which gives promise of a picture. It is often necessary to ask the sitter to walk around the studio if the position first taken up appears at all awkward, or even to try a totally different pose, reverting to the first one afterward. I have found it useful to tell the sitter what to do in the same way as stage directions are given. Thus I would say, "I want you to walk up to the table, pick up the photograph and turn around and tell me what you think of it." Nine times out of ten the sitter catches the idea, and the result is natural and usually more or less graceful. As I have already hinted there are certain types of figure with which a standing pose is impossible, and for these a suitable sitting position must be found, which should not be a difficult matter.

With sitting figures the hands play an important part in the composition, and we are here face to face with one of our greatest difficulties. If we compare the hands of the average person with the hands as rendered by portrait painters we are driven to the conclusion that either the painters are very fortunate in finding models with small and graceful hands or that they deliberately represent them on a smaller scale than the rest of the figure. The latter course is impossible to the photographer, and he must therefore endeavor to place the hands in such a position that they appear easy and graceful and must avoid exaggerating their size by faulty management of his apparatus. Here again I urge the operator not to attempt to twist the hand or to alter the position of individual fingers, but to suggest to the sitter what is required until a satisfactory result is obtained. As a rule the hands should not be shown in their full breadth, but more or less edgewise, and care should be taken that some of the fingers are not closed upon the palm, as this frequently gives the effect that they have been amputated. Unless the hands are actually engaged in some action, such as holding a book, arranging flowers, or playing with a necklace, the muscles should be relaxed. The arm of a chair should not be gripped or the hand clenched; above all the fingers should never be interlocked as this gives an excessive clumsy appearance. Many effective poses may be obtained by resting the face upon the hands, the simplest being when the half-closed hand supports one side of the head. In this case one must be careful that the hand only touches the cheek lightly and does not push the flesh up into a lump above it. Other somewhat similar poses are obtained by placing the two open hands together and resting the side-face upon the back of one or by interlacing the finger-tips and resting the chin upon them, the elbows being of course supported upon a table.

It is when the hands rest in the lap or upon the knees that they are usually most obtrusive, and this appearance should not be aggravated by allowing a strong light to fall upon them. A small screen, placed so as to reduce the light on the lower part of the figure, will help considerably in reducing the prominence of the hands. The camera vignetter may even be employed so as to throw the lower part of the figure into semi-shadow. This dodge is extensively used by some successful workers.

The swing-back of the camera is a trap for the unwary when dealing with the hands of a sitting figure. It will, it is true, bring them into focus without reducing the aperture of the lens, but at the expense of increasing their apparent size. With the rapid plates now available it is possible to stop down to a reasonable extent and yet not to cause an unduly long exposure. I have found that excellent results can be obtained by having the camera rather higher than usual and pointing the lens downward, thus bringing the face and hands nearly upon the same plane. When doing this it is necessary to see that the head is not depressed too much or the picture will not be satisfactory. Fortunately full length portraits are in little demand at the present time except for people in uniform or fancy dress, for in the majority of cases a three-quarter length makes a much better picture. It also places a valuable power in the hands of the photographer as it allows him to reduce the dumpy appearance of a short figure. We may take a three-quarter length of a figure which only just misses the edge of the skirt and give the appearance of a person of average height. With men, a little more care is necessary as the distance between the bottom of the coat or jacket and the edge of the picture must be nicely balanced or the desired effect will not be produced.

I must not forget to remind my readers that the power of suggesting poses to the sitter is of great value and should be cultivated, when the physical attributes of the operator permit—that is to say, that if a movement of the limbs or a pose of the hands is suggested, it is apparently unconsciously enacted by himself. If the head is to be raised or turned, or the hands moved, the request may be accompanied by the appropriate gesture, generally with satisfactory results. Even farther than this, it is sometimes useful to show the actual pose in the position the sitter is to occupy, and to invite him or her to copy it. Naturally this requires a little study on the part of the operator, who must have a proper idea of what he looks like when he assumes certain poses, otherwise he may only succeed in making himself appear ridiculous.—*B. J.*

Experimenting with Lenses

To many photographers the lens is a mysterious piece of apparatus, the behavior of which cannot be foreseen, and any departure from the ordinary method of use can only be carried out by working strictly to rule. That optics is an abstruse science one may admit: but there is no reason why the least scientific of photographers should not know the capabilities of his lens, not only when it is used on strictly orthodox lines, but also otherwise. There are simple experiments which may be made with it, which do not involve any risk of injury to the lens itself, and which may show the photographer that he has powers at his disposal which he did not suspect. If they do not do this they will at least teach him what his tools will do.

Any lens which will magnify will form an image, of a sort. It is true it may be a very blurry image, if it is used just as it is: but this may be remedied to a great extent, while, of course, there are many workers who are glad to have the means of getting a blurred picture when they will, although in most cases they may prefer a sharp one. If the reader has a lens the components of which are mounted in metal cells, and so can be readily removed, he can examine these, and try any of them which may be magnifying glasses, by noting on the focussing screen the kind of image which they will give.

The focussing screen will enable him to form some idea of their performance; but this may be confirmed by the exposure of a plate. If the lens give an image which is visibly far from sharp, we may be sure that the photograph also will not be sharp. It may be much more blurry than it appeared on the screen. This will indicate that the lens in the form in which we are using it is not corrected for color; it is not "achromatic," as it is termed. The result of this is that the rays which are most visibly powerful, and which, therefore, are those by which we see to focus, do not come to a focus at the same point as those which are the most active photographically.

There are two methods by which this can be remedied: One is, after focussing, to move the screen inward to the requisite extent to allow for the difference. This is not quite a constant amount, but it will be near enough if we take it to be one-thirtieth of the extension. So that if the sharpest image on the screen is obtained when the lens is five inches from the screen, we may bring the lens and screen nearer together by one-sixth of an inch after focussing, and so obtain in the negative the same definition as we saw on the ground glass. The other method of correction referred to is theoretically interesting rather than practically serviceable. It is to use an orthochromic plate and a deep color screen, so deep that the photograph is taken with rays of the same kind as those used in focussing.

If with such a lens as this as sharp a picture as possible is required, we shall have to use a small stop. Temporary stops are easily made of thin card, or thin sheet brass, cutting the hole with a punch or scissors, and then carefully blackening all the stop.

The best position for the stop must be found by trial. It will depend not only on the nature of the lens, but on the work required from it. If the lens has two dissimilar surfaces, as it is almost sure to have, we may try it first by turning the more convex side toward the ground glass, and putting the stop on the other side of it and distant from the lens by about the diameter of the glass or a little less. The greater the angle at which the lens is used, the smaller and, to some extent, the nearer must be the stop.

The suggestion just made as to the position of the lens should be regarded as a suggestion and nothing more. The lens may be tried the other way round, and if it is found that this gives better definition, or if for any cause it is more convenient, there is no reason why that should not be adopted. The nature of the image can be seen on the screen; and we need no other guide than that.

Except poor definition, a remedy for which we have already indicated, the only other defect likely to give trouble is flare spot; and this also should be seen on the screen if it is present in an aggravated case. A flare must be present with every lens, it may be remembered: what has to be done is to arrange that, instead of making a well-defined patch of fog somewhere in the picture, it is spread over the entire area of the field, so that it is weakened and made practically harmless. With a single lens it should never be very bad, and by adjusting the position of the stop it can be made to disappear entirely. A very slight movement of the stop to or from the lens may be quite sufficient for the purpose.

A cause of a kind of flare, which in any experiments with lenses should be looked to, is the presence of bright metal anywhere within sight of the lens. If one lens is unscrewed from the mount and the remaining one is used, the threads from which the one was removed will be sure to be bright and cause fog on the plate unless prevented. A little ring, formed by winding a strip of gummed paper round something of a suitable size, should be made, and when the gum is dry should be given a coat of dead-black varnish. This ring can then be slipped into the mount so as to cover the bright screw-threads. It may be convenient to close one end of the ring with card, so as to make a kind of pill-box of it, and to perforate the card to form a stop. The position of the stop can then be adjusted by sliding the fitment in or out of the mount, until the best place for it has been found. This can then be indicated once for all by making the ring part of such a length that when the pill-box is pushed as far as it will go the stop is in position.

Lenses which, instead of being mounted in metal rings, are dropped loose into a cell and secured in position by screwing a ring down upon them, are very prone to have bright part either on the edges of the glasses themselves or on the inside of the cell, and these should therefore be examined, and if necessary blackened.—*Photography.*

Get it in the Lighting

(Concluded from February)

HERE, again, not only must special attention be given to the slighting, but they must be treated in such a manner as to bring out the pattern and design in bold relief. This is accomplished by photographing them when they are suitably distended on stretchers, and placed under a very high top-light only, with an absolutely black background, and this must on no account be brought close up to the fabric, as many suppose, and sometimes actually placed in contact with the curtains.

For a background in work of this description there is nothing to equal black velvet, placed at least twelve to fifteen inches behind the fabric, and when such arrangements are carried out, and a slow transparency plate used with a very full exposure under a high top-light, beautiful reproductions of the finest design and traceries are possible of accomplishment.

In work of this description the least inequality of lighting will be apparent when the negatives reach the printing stage, so that it frequently happens that some experience and previous test of which is the best portion of the studio to employ at a given hour of the day is required, so as to produce nice, even results that permit of good process blocks being produced.

ABSTRACTS AND TRANSLATIONS

BY E. J. WALL, F.R.P.S.

Chromium Intensification

R. E. Crowther deals with the phase of this subject brought up by Lumière and Seyewetz, and points out that, although no bromine compounds analogous to the chlorochromates have been prepared, yet the following bath gives excellent intensification:

Potassium bichromate . .	10 gm.
Hydrobromic acid (25 per cent.)	10 c.c.
Water	1000 c.c.

After the image is bleached it should be well washed to remove the bichromate stain and then redeveloped.

Mr. Crowther assumes on analytical grounds that the bleached image consists of a basic chromic salt plus absorbed chromic acid, CrO_3. He takes theoretical exception to Lumière's formula for the silver salt.—*B. J.*, 1919, p. 709.

The Keeping Power of Sensitive Materials

M. Vallot, induced by the soaring prices of sensitive materials, has been testing out some plates, films and papers of various ages with decidedly startling results.

Some Lumière ortho plates purchased in 1911–1913, thus at least six to eight years old, were exposed side by side with the same make made in 1919, and showed on development not the slightest difference. Other plates of the same kind, bought between 1897 and 1906, also gave excellent results. Some extreme rapidity plates, five years old, were also found good, though suffering from general fog.

Some kodak cartridges, which bore the usual mandatory notice that they must be developed before April, 1917, were also found in excellent condition. And some Lumière films, to be developed before July, 1902, were found to give good negatives when development was pushed with amidol to the extreme although general fog showed.

Bromide paper and printing-out paper made in 1912 were also found to give satisfactory prints. Some amidol and sodium sulphite in corked bottles, which had been partly used acted well. All these materials were kept at Chamonix without any special precautions on open shelves and the house was only occupied nine months in the year, so that there were considerable variations in temperature and humidity.—*Phot. Rev.*, 1919, p. 180.

The keeping power of sensitive materials has always been a debatable point and particularly in the case of ortho plates and films. I have records of plates made comparatively early in dry plate work, in 1889, that were good fifteen years after, and cut-sheet films that were good seven years. On the other hand some films have been known to deteriorate hopelessly in less than nine months.—*E. J. W.*

Bathed Plates

Von Huebl gives the following useful summary of the various methods of bathing plates:

Sensitizing of the plates is best carried out in a completely dark room, although with erythrosin deep red light may be used and for red sensitive plates a deep green light, but for panchromatic plates it is best to work in total darkness. No difficulty will be found in working in darkness with a little practice and it is actually more convenient than when the light has to be so reduced that there is practically very little seeing. If the plates are protected from any light and they are rapidly dried perfect plates free from fog will be obtained.

All the panchromatic sensitizers (isocyanines) can be used in aqueous solution, with pinachrome violet the addition of 20–30 per cent. of alcohol is necessary to obtain with certainty clean plates.

Koenig recommends that plates sensitized in an aqueous solution should be washed for about two minutes in running or frequently changed water before drying; but the film of dye that separates out on the surface of the plate, and which is the cause of fog and spots, is completely insoluble in water and cannot, therefore, be removed by washing, and numerous experiments have proved that the washing of bathed plates may well be omitted.

The red sensitizers absolutely require solutions containing about 30 to 50 per cent. of alcohol. The necessary quantity of the dye in the baths is extremely small, and the best concentrations are from 1 : 30,000 to 1 : 100,000. Stock solutions of the dyes 1 : 1000, in 95 per cent. alcohol, should be prepared, and these will keep in the dark indefinitely, and of these stock solutions from 1 to 3 c.c., according to the tinctorial power of the dyes, should be added to every 100 c.c. of the working solution. If there is too little dye the sensitizing is poor.

The following data gives all the necessary formulas:

Panchromatic Sensitizers: Homocol, ethyl red, orthochrom T, pinachrome and pinachrome violet, 6 c.c.; pinaverdol and isocol, 9 c.c. to 300 c.c. of water, or 200 of water and 100 c.c. of alcohol.

Red Sensitizers. Pinacyanol, 4 c.c.; water, 200; alcohol, 100 c.c. Pinachrome blue, 4; water, 180; alcohol, 120 c.c. Pinacyanol blue, 4; water, 150; alcohol, 150 c.c.; dicyanin, 9; water, 170; alcohol, 130 c.c. To every 300 c.c. of the bath should be added 3 c.c. of cold saturated solution of borax or 5 drops of ammonia.

Green Sensitizers. Erythrosin, 20; water, 300 c.c.; ammonia, 5 drops.

If a drying chamber with proper ventilation is not available, then alcoholic baths should be used for all dyes in order to hasten the drying to prevent the strong swelling of the gelatin in warm weather. Single plates can be treated in glass or porcelain dishes; for larger numbers the well-known stand development tanks may be used. The plates should be left in the liquid for three or four minutes and dried as rapidly as possible.

According to Koenig, 300 c.c. of an aqueous bath can be used for not more than ten 9 x 12 cm. plates (=10 fluid ounces for about 167 square inches), and the the bath should be thrown away. With the alcoholic baths from twelve to eighteen plates can be sensitized, and even then the bath can be strengthened by the addition of 2 or 3 c.c. of dye solution for further use.

Instead of the 90 per cent. ethyl alcohol, denatured alcohol may be used, and Valenta recommends the addition of 50 per cent. of methyl alcohol to the baths, especially with dicyanin. Acetone may be used to 50 per cent., and has been proved useful with ethyl red, pinachrome and dicyanin.

The deposition of the dye on the surface of the plates, which has been mentioned above, may be completely overcome by immersing the plates, no matter whether aqueous or semi-alcoholic baths are used, for about one minute in 90 per cent. alcohol and keeping them in motion. The precipitated dye is completely dissolved, the sensitiveness remains unchanged, the plates dry very quickly and give very clean negatives. This method ought to be considered as the most practical, and only because it is somewhat inconvenient and the consumption of alcohol rather costly it cannot be generally recommended.

Koenig has recently recommended a bathing process without alcohol, which is based on a method suggested (1894) by Debenham, in which the superficial deposition of the dye is obviated. The plate is first bathed in an alcoholic solution of the dye, which may be carried out in red light as actual sensitizing does not take place; the plate is then dried and placed for a short time in a bath of water, which induces color-sensitiveness. The alcoholic bath consists of:

Dye solution, 1 to 1000 . .	5 c.c.
Alcohol, 90 per cent. . . .	100 c.c.

and it is sufficient to immerse the plate in this solution for a short time. After drying, for which about five minutes is required, the surface of the plate is evenly coated with a trace of the dye, and in this condition the plates may be kept for any desired time. In order to make the plate sensitive they should be immersed in water for about five minutes, when the dye goes into solution and this is absorbed by the swelling gelatin and penetrates the silver bromide and makes it color-sensitive. The plates must then be dried as quickly as possible.

This process deserves the most complete consideration, for it gives absolutely clean working plates and one is independent of the condition of the dye bath and therefore equal results are always obtainable. The alcoholic dye bath will keep indefinitely in the dark, and by repeated use its concentration increases and some more alcohol has to be added. The process is also more satisfactory than bathing with dye solutions as it is much pleasanter to work in an absolutely dark room with aqueous than dye baths.

If a large number of plates have to be treated, a dipping bath should be used and for washing them a tank development trough.

The process is, however, only useable with the panchromatic sensitizers, which are soluble in water, even if only slightly, and very satisfactory color sensitiveness is obtained; for instance, pinachrome gave v=0.25. The red sensitizers which are not soluble in water, do not act well with this process. For instance, pinachrome violet gave v=0.07 and pinachrome blue v=0.03. Pinacyanol is an exception, this gave v=0.17.

Weissenberger, in 1886, suggested a method which has certain advantages. And it is based on the fact that the panchromatic sensitizers are decolorized by traces of acetic acid, and that the original dye is regenerated from the colorless liquid on drying. If, therefore, a plate is bathed in a colorless solution, it will become color-sensitive on drying. The following bath is used:

Dye solution	6 to 9 c.c.
Glacial acetic acid . . .	1 drop
Water	300 c.c.

In warm weather from 50 to 100 c.c. of the water may be replaced by alcohol.

The addition of the acetic acid makes the solution colorless, but with pinachrome violet is yellowish, with isocol and homocol reddish. The dyes lose their colloidal character and penetrate the gelatin. The plates should be left in the bath from three to four minutes and then dried as quickly as possible in an absolutely dark room. The process gives clean plates and has the advantage that they can be bathed in red light, but care must be taken as the plates rapidly dry and then become color-sensitive. The color-sensitiveness is satisfactory, although it may not attain that under the most favorable conditions.

The sensitizing with the acetic bath gave pinaverdol v=0.17, pinachrome v=0.27; while with neutral or alkaline baths the figures were 0.20, 0.29 and 0.45 respectively.—*Das Atelier*, 1919, p. 98.

VIEWS AND REVIEWS

The American Annual of Photography for 1920

The publishers of this well-known and popular annual deserve great credit for issuing at this time of strikes and all sorts of labor difficulties, this attractive manual and maintaining so high a standard.

The subjects covered are numerous and helpful and the illustrations are profuse and effectively reproduced. Every photographer will gain something of usefulness from its pages. George Murphy, Inc., New York City, are the sole agents, and the price, paper edition, $1.50, and cloth, $2.

Report of the Monthly Meeting, Metropolitan Section, Professional Photographers' Society of New York

The Metropolitan Section held its first informal dinner of the New Year at the Hotel Astor on the evening of January 14, 1920. The dinner was tendered to Mr. John H. Garo, of Boston, Mass., and our guest for the evening was Dr. C. E. K. Mees, of the Research Laboratory of the Eastman Kodak Company.

After the dinner, when the cigars were passed around, Mr. Hoyt, the chairman, addressed the members and spoke very feelingly of the support that was given him under the new order of things, and was exceedingly gratified at the large attendance. He spoke of the good beginning that was made, and was hopeful for larger and greater things to benefit not only our section but the profession generally. Concluding his remarks he introduced "the boy of yesterday, the workman of today," Mr. Garo, who spoke interestingly in a reminiscent mood.

Following Mr. Garo, our chairman introduced Dr. Mees, who gave a most instructive and interesting lecture on emulsion-making and the developing agencies.

This lecture was made doubly interesting by illustrations on the screen. After Dr. Mees finished his lecture he graciously answered many questions and a rousing vote of thanks was extended to him.

A short business meeting followed and it was voted that each member be allowed to invite to the next dinner two friends who might be eligible to membership in the society.

The section also went on record favoring the daylight saving law, and the secretary was instructed to notify Mr. Marcus Marks, President of the National Daylight Association, to that effect.

L. L. de Anquinos, Secretary.

Chicago Photographers

At the annual meeting of Chicago's Associated Portrait Photographers, the following officers were elected: William A. Graber, President; R. F. Gentzel, Vice-President; John Lavecchia, Vice-President; A. S. Hurter, Secretary; Jarvis Weed, Treasurer.

Membership Committee: William Louis Koehne, Morris Levitt, C. A. Mayo, Miss Helen Webster.

Committee on Entertainment and Demonstration: Joseph D. Toloff, W. C. Smith, Eugene R. Hutchinson.

The Association has in mind for the coming year a great many activities, among which is a masked ball for employees and owners, lake trip to Milwaukee and automobile excursions.

The members of the Association have derived a great deal of benefit from the organization and the officers expect to make the coming year a big one for all of the members.

A. S. Hurter, Secretary.

"Airplane Photography"

By Herbert E. Ives, Major in Charge of Experimental Department, Photographic Branch, Air Service. 210 illustrations. Octavo, $4. J. B. Lippincott Company, Philadelphia, Pa.

Airplane photography passed through a period of feverish yet remarkable development in the great war. Its growth in times of peace is sure to be even more wonderful and rapid. There are infinite possibilities and practical uses to which aërial photography may be put. In the preparation of this manual, although it is assumed that the reader is a practicing photographer, yet considerable space has been devoted to the fundamentals of photography and scientific methods of study, tests and specifications. This has been done because aërial photography strains to the utmost the capacity of the photographic process, and it is necessary that the most advanced methods be understood by those who would secure the best results or make the next advance.

The author has had a wide experience and in this work covers the subject very thoroughly and emphasizes those general scientific principles which apply, no matter what may be the purpose, to making photographs from the air. To this end the author has kept constantly in mind the peaceful application of photography, although his knowledge has been drawn from experience covering military assignments.

The book is divided under seven general heads: Introductory; The Airplane Camera; The Suspension and Installation of Airplane Cameras; Sensitized Materials and Chemicals; Methods of Developing Plates, Films and Papers; Practical Problems and Data; The Future of Aërial Photography.

Airplane photography was developed, to meet the exigencies of the war, to a remarkable point. This survey of that development, covering every phase of apparatus and production, by an officer in this branch of the service, will be of wide interest, since aërial photography has an important field offering great opportunities in peace time. A practical manual.

David Bachrach Celebrates Fiftieth Anniversary

David Bachrach, pioneer in the photographic field of America and one of the best-known business men of Baltimore, was the guest of honor on January 31, 1920, at a dinner given at Hotel Emerson by the heads of the departments in the Bachrach studios in seven large cities in the eastern section of the country. The function marked the golden anniversary of the firm, it having been established in 1869. Mrs. Bachrach occupied a seat of honor beside her husband at the dinner, and came in for a large share of the felicitations.

As an expression of the love and high esteem in which they are held by the employees, Mr. and Mrs. Bachrach were presented a handsome silver service during the evening, and an additional honor was conferred upon Mrs. Bachrach in the presentation to her of a large bouquet of roses.

Mayor Broening, who was one of the special guests at the event, spoke of the high character of Mr. Bachrach and of his usefulness in the life of the city, and stated that there was no man in any branch of the city's business or social life for whom he had more genuine regard and affection than for the guest of the evening. He stated further that he wished the city possessed more men of the type of Mr. Bachrach, and that men of his type were essential in the development of the proper civic and social spirit in any community. He complimented him on the success of his business career and predicted even greater successes in the future.

There were about 150 men and women at the dinner, representing the Bachrach studios at Boston, New York, Philadelphia, Cleveland, Washington, Atlantic City, Annapolis and Baltimore. C. F. Diesinger, general manager of the whole enterprise, was master of ceremonies. One other feature of the event was the presentation by Mr. Bachrach of a number of service medals to persons in the service of the firm; bronze medals for those who have been with the firm for from three to five years, silver medals for those in the service five to ten years, and gold medals for those in the service ten years and over.

The other guests of honor at the dinner, in addition to Mr. and Mrs. David Bachrach, were: Miss Helen Bachrach, Miss Hannah Keyser, Ephraim Keyser, Louis Fabian Bachrach, Mrs. Louis Fabian Bachrach, Moses Bachrach, Mayor Broening, A. Clements, C. J. Abel, N. H. Busey, Edwin P. Hayden and H. W. Pierson.

Walter K. Bachrach, the younger son, is at the head of the Bachrach organization at present. He took active charge of the business about six years ago when his father, the founder, began to feel the strain of his energetic business career. Being a man of keen judgment, rare executive ability and of even temperament. Walter Bachrach has injected much of his own personality into the organization and it is noticeably reflected in the work of the employees. The older brother, Louis Fabian Bachrach, is at the head of the sister organization located in various cities of the New England States, and likewise, is a man of unusual business sagacity, and tempered with the necessary artistic qualities.

Wanted—Pictures

The Bausch & Lomb Optical Company is in the market for pictures that are tests of real lens efficiency. Satisfactory prices will be paid.

Speed pictures of other difficult studies illustrating the remarkable corrections, reserve covering power, and sharp, clear definition given by the Bausch & Lomb Tessar series are particularly desirable, while samples of work done by the Protars, a more convertible lens, are likewise asked for from the world of photography. Pictures of a timely and interesting nature are naturally the type preferred.

Glossy prints should be submitted for inspection, and, if accepted, the company prefers to buy the negatives outright.

The address to which all prices should be submitted is Bausch & Lomb Optical Company, 632 St. Paul Street, Rochester, N. Y.

Wentworth Exhibition

Bertrand H. Wentworth, of Gardiner, Maine, the well-known landscape and marine photographic artist, will give an exhibition during the month of March at the Camera Club, 121 West Sixty-eighth Street, New York. We are sure it will be worth while to visit this exhibition.

The New York Convention of P. P. of S.

The New York State Convention held at the Hotel McAlpin, February 3, 4, 5, was somewhat disappointing in attendance. This was no doubt due to the severe snow-storm and other unfavorable conditions. But those present enjoyed the good fellowship, and the program which was interesting and most profitable.

Lejaren à Hiller's talk on his methods of making his effective illustrative groupings and Miss Jessie MacDonald's talk on letter-writing were the outstanding features.

Walter Shinn's talk on "Child Portraiture" and Pirie MacDonald's on "Selling" were two other very worth-while parts of the program.

The exhibition of prints was of the highest order and deserves much praise.

The Convention next year will be held at Rochester.

Officers for 1920–21.—President, J. E. Mock, Rochester; Vice-president, Carl Frey, Utica; Secretary, B. J. Holcombe, Rochester; Treasurer, Edwin Park. Oneida.

The WORKROOM

CONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

Formosulphite—A Substitute for the Alkalies in Development
Permanent Red, Green and Blue Tones on Development Papers
Sensitizing Celluloid for Printing Purposes
Toning Bromide Paper
Transparencies for Window Decorations
Development of Ultra-rapid Plates
Coloring Photographs
The Working of Development Papers
Intensification: The Best Method
Some Points on Copying.—III
Replenishing Cinematograph Tank Developers
Photographing Dogs

THE WORKROOM

By the Head Operator

Formosulphite—A Substitute for the Alkalies in Development

In 1896 MM. Lumière and Seyewetz, says the *British Journal*, pointed out the possibility of using the aldehydes and ketones, in the presence of sodium sulphite, as substitutes for the alkalies in developing, and only the acetone-pyro and hydroquinone-formalin developers have been practically adopted, and these to a somewhat limited extent. Most of the other aldehydes and ketones have certain disadvantages which have precluded their general use; for instance both acetone and formalin are extremely volatile, and the latter, unless Schering's formaldehyde be used, is very likely to be contaminated with impurities, and this particular preparation is dear, though unless large quantities are used this need hardly be taken into consideration. To get over these difficulties the above investigators now suggest the use of trioxymethylene or paraformaldehyde, which has the chemical formula $(CH_2O)_3$, and is a polymeric compound of formaldehyde CH_2O. Paraformaldehyde is a white crystalline powder, slightly soluble in water, and at ordinary temperatures gives off formalin, and is frequently used because of this property in medical and surgical practice. Though slightly soluble in water, it is far more soluble in solution of sodium sulphite, and it is to a mixture of 3 parts of para-formaldehyde and 100 parts of anhydrous sodium sulphite that MM. Lumière and Seyewetz have given the name of formosulphite. The theoretical explanation of the use of this compound is, for instance, in the case of paraphenylendiamine, that the first traces of hydrobromic acid liberated in development are absorbed with the formation of hydrobromate of paraphenylendiamine, and this is in turn decomposed by the sulphite of soda and the reducing agent again set free, and sodium bisulphite is formed, and this is absorbed by trioxymethylene with the formation of a bisulphite compound of the formula $3HCHO + 3NaHSO_3$, or $3HCHO + 2NaHSO_3$; on the basis of this explanation very small quantities of formosulphite are required, in fact only one-hundredth of the normal quantity of alkaline carbonate. Two typical formulæ with this new agent are:

Pyrogallol	1 part
Formosulphite	9 parts
Water	100 parts

And

Metol	0.5 part
Hydroquinone	1 part
Formosulphite	8 parts
Water	100 parts

One of the advantages of this new compound is that it hardens the gelatin, and thus would be of use in hot countries.

Having regard to the hardening action on gelatin, MM. Lumière and Seyewetz also tried the new compound in the combined toning and fixing-bath, in place of alum, and found that it was advantageous to use equal weights of trioxymethylene and a mixture of 10 parts of sodium sulphite and 40 parts of salt, and of the complete mixture only 0.3 per cent. was required in the combined bath, and that 3 parts of the salt formosulphite produced the same effect as 20 to 30 parts of alum. One of the great advantages of the mixture is obviously that, being alkaline, it produces no decomposition of the hypo, and there is, therefore, considerably less chance of sulphuration of prints, and the toning baths do not require boiling, as is the case when alum is used.

Dealing with the new product the editor of *Photography* adds the subjoined note:

The use of formosulphite, as the "accelerator" in development, is causing some comment and discussion. Paraformaldehyde is non-volatile and solid, unlike its brother compound formaldehyde; it is soluble in sodium sulphite solution, giving the so-called "formosulphite," which, we take it, will sooner or later be placed upon the market. Some of the later experiments carried out were to determine to what extent paraformaldehyde dissolves in solutions of sulphite of various strengths, and to what extent mixtures of different proportions of sulphite and paraformaldehyde are soluble in plain water. The results are rather curious—in fact, just as *apparently* inconsistent as are so many things that take place in chemistry. Thus one ounce of a 5 per cent. sulphite solution will dissolve an hundred and six grains of paraformaldehyde, while the same quantity of a 20 per cent. sulphite solution dissolves a hundred and ten—a difference of about 3 per cent. in solubility for 15 per cent. concentration of the sulphite. Again, an ounce of a 25 per cent. sulphite solution dissolves a hundred and thirty grains of paraformaldehyde, so that in this instance a difference of 2 per cent. in solubility occurs for 5 per cent. concentration of sulphite. The experiments show, however, that in order to dissolve the greatest quantity in the sodium sulphite solution, the latter should be 20 to 25 per cent.; a higher percentage makes no difference.

Permanent Red, Green and Blue Tones on Development Papers

In view of the increasing tendency toward the production of colored prints on development papers (*i. e.*, bromide and gaslight), some notes on the production and permanency of such should be of current interest.

Without going into the history of bromide toning, it is sufficient to say that the early production of colored prints on these papers was a speculation in the matter of preserving the same gradations in the toned print as in the original black and white, apart, of course, from the raising of the shadows from black to the tone color.

The effects of intensification and reduction which were produced by some processes were disastrous, not only in their unknown limits, but also in their unknown action on different intensities of the black and white image. In addition to this, there is no doubt that although a sufficiency of the toning material might be included in the solution for several prints, yet a visible difference in the intensity of the tone color in each succeeding print could sometimes be observed. This action has always been somewhat difficult to account for.

The instability of colors produced by uranium salts seemed, for some unknown reason, to check the desire on the part of experimenters to investigate the possibilities of other methods, and acted as a set-back to progress in this direction.

For many years the practice of color toning was confined to the pictorial worker, and no serious efforts were made by technical workers to investigate the matter. Two very important points, however, have been fairly obvious.

The first of these is that the intensity of the color contrasts is absolutely dependent on the condition of the developed silver in the original print; that where exposure has been excessive and development curtailed, the silver being in an incompletely developed state, the resulting color tone is bound to be correspondingly weak, and that the most intense color deposit can only be secured by the original print being developed to infinity, the resulting contrasts, of course, depending on the quality of the negative.

The second point is that if an indirect process is used in which the silver image is first converted to a convenient silver salt to be reconverted into a metallic salt, the contrasts will be formed entirely by the tone color itself; and that where control of contrasts is required it must be obtained by a direct process in which the original black silver forms a part of the image.

Until recently the indirect processes were the most certain in their production and permanent in the results, for reasons which will be presently explained.

Of the metallic salts which produce the three colors mentioned in the title of this article, only those in which silver ferrocyanide acts the part of the tone-color receiver will be dealt with. In the case of the red the sulphide-gold process will produce practically the same tone, but it is hardly a popular possibility by reason of its expensive nature and lengthy operation. With the green and blue no other processes are available.

To the commercial producer of toned prints three things are of paramount importance: (1) Cost of production; (2) rapidity of production; (3) simplicity of production. Bearing these points in mind, let us deal with the various colors in turn.

Red

If an alkaline solution of copper sulphate be added to a solution of potassium ferrocyanide a brick-red precipitate with a tinge of crimson is produced, the intensity varying slightly up to a limited extent on the strength of the solution.

If an acid or neutral solution of copper sulphate be added to a solution of potassium ferrocyanide, a chocolate precipitate is produced.

Presumably both precipitates consist of copper ferrocyanide according to the equation:

$$\underbrace{\underbrace{\underset{156567284}{K_4FeC_6N_6}}_{368} + \underbrace{\underset{12764128}{2CuSO_4}}_{319}}_{687} = \underbrace{\underbrace{\underset{127567284}{Cu_2FeC_6N_6}}_{339} + \underbrace{\underset{15664128}{2K_2SO_4}}_{348}}_{687}$$

Copper ferrocyanide is a remarkably stable salt, insoluble in acids, resisting to some extent the solvent action of very weak, but completely soluble in caustic, alkaline solutions. In the pure state it is almost impervious to the action of sulphuretted hydrogen.

In producing this salt on a bromide print by the old Ferguson process, the operation was a prolonged one, owing to the fact that in the combination of copper sulphate and ferricyanide of potassium the ferricyanide, being in a neutral or slightly acid condition, acted very slowly in converting the silver into silver ferrocyanide. It has been said that copper ferricyanide was formed first, causing an abstruction to the formation of the ferrocyanide. Some experiments to prove this latter have been partially successful, but not completely.

By employing the alkaline method the process is much more rapid, since the alkaline ferricyanide is a far more powerful oxidizer.

In the alkaline process also there is an absence of stain in the whites due to the presence of a comparatively large volume of ammonium carbonate, which, being a non-caustic alkali, will not decompose the ferrocyanide, but prevents the tendency of a combination of the ferrocyanide and the gelatin and organic texture of the paper as occurs in the acid process.

The combination of a copper salt in the form of copper sulphate dissolved in a large excess of ammonium carbonate saturated solution, with the after addition of a solution of potassium ferrocyanide, form an inexpensive single solution, which will tone a print in three to four minutes. See formula for red.

There is a condition essential to the permanency of all these processes which will be given later.

Green

The desirability of this color for graphic representation of any kind does not come within the scope of these notes, beyond the fact that there is an increasing demand for it and that it should be of an olive or Italian shade.

Of the salts most favorable to its production from all considerations, continued research shows vanadium to be the most suitable.

If ammonium vanadate be ignited, vanadium oxide is formed, and this being completely soluble in hydrochloric acid a solution of vanadium chloride, V_2Cl_2, or VCl, or V_2O_2Cl (there is some difference of opinion in various authorities) of known strength is formed. The commercial vanadium chloride, as purchased in the paste form, contains a large amount of the higher oxides of vanadium, which are insoluble, amounting to 10 or 15 per cent. of the weight. If purchased in this form, an estimation of the amount of available vanadium should be made, the drop reaction with potassium ferrocyanide being a simple and convenient method.

In taking for an accepted fact that the color tone produced by the application of vanadium chloride to silver ferrocyanide is due to the formation of vanadium ferrocyanide, the writer is fully aware of the absence of satisfactory information on the point, and till quite recently based his conclusion on the product of the addition of vanadium chloride to a solution of potassium ferrocyanide. A qualitative analysis of the precipitate by ignition indicated iron and vanadium oxides with cyanogen given off, the filtrate containing, as far as could be ascertained, nothing but potassium chloride in hydrochloric acid. The equation, however, does not seem to fit in. Strenuous effort for information on the point has brought from a reputed authority in Germany the following formula for vanadium ferrocyanide, V_2OFeCy_6, which, apparently, is a vanadyl compound similar in construction to the uranyl salts.

Vanadium ferrocyanide, produced as above, seems to be a remarkably stable salt, insoluble in acids, about as impervious to sulphuretted hydrogen as the copper salt, but possessing decidedly less resistance to non-caustic alkalies.

An acid solution of vanadium chloride containing potassium ferricyanide applied to a bromide print, after somewhat prolonged action, produces a bronze-green color in the shadows, the lighter parts being but feebly attacked.

If, however, a ferric salt be included, the action is entirely different. In this case the silver assumes—according to the quantity of iron present—a slate-blue tint, the intensity of which does not increase beyond a certain point. Just before this point—the exact determination is rather a difficult matter—no vanadium, or very little, is deposited, and after it has started to deposit no further accumulation of the blue—due to the iron—occurs.

On washing the print the vanadium reagent stain and the blue coloration can be completely eliminated, leaving an olive or Italian green color tone behind, the shade differing with platino-matt and ordinary papers. But at this stage the color is not permanent, showing a similarity of state to the red and blue.

To preclude a precipitation between the ferricyanide and the vanadium a preventive such as oxalic acid is required; a citrate will not do, as it prevents the toning action.

Of the ferric salts the chloride seems less suitable than others, such as a citrate or oxalate, since there is a distinct tendency to bleaching with its use.

The adjustment between the iron and the vanadium has to be exceedingly fine to obtain the best results, but once fixed the process may be made absolutely automatic in its action in that prints allowed to tone for a definite time in a sufficiency of the constituents will all be of the same character as to color intensity; and more than this, the same solution diluted to any increased volume will give precisely the same color tone if the toning time be increased proportionately. For commercial purposes this is of great value, since it does away with the necessity for the personal judgment of skilled operators. The vanadium is not an expensive salt.

Blue

There is little to be said on this process beyond the choice of the ferric salt, the inclusion of a precipitate preventive, and the use of nitric acid in preference to hydrochloric to prevent the tendency to bleaching. In all these it is similar to the green, and, like it, prints may be toned in two minutes or longer, according to dilution, and in a similar automatic manner.

Permanency

In all these silver ferrocyanide processes it is conceivable that some very short period must elapse between the formation of the silver salt and its reconversion by the tone color reagent into each particular metallic salt.

Short as this period may be, and it is probably infinitesimal, at whatever stage the reaction is stopped, providing it is before the infinity limit, there is always a considerable amount of silver ferrocyanide unconverted. If this is left in the print two evils will result: (1) The silver ferrocyanide will infallibly darken on exposure to light, with consequent degradation of the print; (2) the affinity of silver ferrocyanide for sulphur will rapidly cause the absorption of the least traces in the atmosphere.

The application of a hypo bath is necessary for the elimination of the unconverted ferrocyanide, and as this must of necessity be an acid one, the acid chosen must be incapable of precipitating sulphur from the hypo; it must not be combined with a sulphite, as there is some risk of destroying the colors, presumably by reduction.

Boric acid is one of the most suitable, and a sufficiency of this, in combination with a 20 per cent. hypo solution, is very efficient, a few minutes' immersion only being necessary for complete elimination of the silver ferrocyanide, the completeness of the reaction being visible by the change of color in the print. A few minutes' washing removes the hypo, but the true color of the tone is not seen until the print is perfectly dry.

Practical Tests for Permanency

Time, of course, is everything, but in the writer's experience two practical tests have been made with prints produced by the foregoing reactions:

1. Three prints in the three colors have been exposed, half covered, to a south aspect window

for ten months, and show not the slightest difference between the covered and uncovered parts.

2. Three prints have been subjected in a dry state, to sulphuretted hydrogen under the following conditions: In each case 0.2 gram of pure sodium sulphide contained in a porcelain basin was covered with 5 c.c. of 25 per cent. HCl and placed in a half-plate plate box, on the cover of which the top half of the print was pasted, with the face down to the basin, the cover placed on and left for thirty minutes, the bottom half of the print being outside the box. Such a quantity of sodium sulphide would give off 0.08 gram of H_2S over an area of twenty-eight square inches. When the prints were removed they retained fumes of H_2S for three or four minutes, but showed no tendency to sulphiding.

The advantages accruing from the employment of processes based on the foregoing may be summarized as follows:

1. With the exception of the red, the original image forms part of the tone color, and by curtailing or prolonging the toning time the shade of color is controllable at will.
2. The processes are automatic in their action.
3. Rapidity and simplicity of production.
4. Permanency to atmospheric conditions.

Formula for Red

Make up the following in the order given:

Ammonium carbonate (saturated solution)	1 oz.
Copper sulphate	10 gr.
Potassium ferricyanide . . .	25 gr.

The precipitate which forms when the copper is added to the ammonium carbonate will be redissolved.

Toning should be continued until the shadows are converted. It is then rinsed for a minute or so and placed in a hypo bath of the following composition for five minutes, and then washed for five minutes:

Hypo	2 oz.
Boric acid	200 gr.
Water	10 oz.

Formula for Green

Ferric chloride	1 gr.
Oxalic acid (saturated solution)	60 min.
Vanadium chloride (pure) .	2 gm.
Nitric acid	5 min.
Water to make	½ oz.

Then add, stirring the while—

Potassium ferricyanide . .	1 gm.
Water to make	½ oz.

Tone from one to two minutes; the longer the immersion the lighter the green. Wash ten minutes and immerse in hypo bath given for red tones. Wash five minutes.

Formula for Blue

Ammonia alum (10% solution)	50 min.
Potassium ferricanide (10% solution)	10 min.
Potassium oxalate (10% solution)	30 min.
Ammonia iron alum (10% solution)	12.5 min.
Hydrochloric acid (10% solution)	2.5 min.
Water	1 oz.

Tone until the desired shade is obtained, and wash free from stain. Then immerse in hypo bath and wash as for green.

Sensitizing Celluloid for Printing Purposes

The beautiful effect that is produced by the transfer of a carbon print upon celluloid has often been imitated by coating celluloid with a bromide emulsion, then by exposure beneath a negative to artificial light or diffused daylight for a few seconds a picture is obtained by development, usually of a blacklead color. To change this color to a brown or sepia, resort must be made to a redevelopment process, or by bleaching and sulphurizing; of course, the right exposure must be hit or the print is useless.

It has long been the desire of the photographer to have ready sensitized celluloid, so that the image may be printed in the same way as sensitized paper, and be enabled to watch the progress of the printing in the same manner. The matted surface of white celluloid presents the appearance of ivory and enables the artist to work up such a print in water colors or monochrome with excellent effect. Celluloid with a glossy surface can also be sensitized if desired. To prepare celluloid for printing-out purposes the following utensils will be required:

One stoneware crock of one gallon capacity, one stoneware pitcher or jug two-quart size, a small kerosene lamp chimney, several strips of glass one inch wide cut from a cleaned-off 11 x 14 negative, to be used for stirring, one yard of cheesecloth, and half a yard of strong canvas such as is used by ladies for wool work, with an eighth of an inch mesh. The cheesecloth and canvas must be washed well in hot water so as to get rid of any sizing they may contain, finally rinsed in cold water and dried; they are then ready for use. The emulsion is now prepared in the following manner:

Gelatin (hard)	4 oz.
Distilled water	12 oz.
Chloride of ammonium (C.P.) .	45 gr.
Rochelle salts	90 gr.

Cut the sheets of gelatin into pieces about two inches wide, dissolve the salts in the distilled water in the stoneware crock, stir well so that the gelatin becomes soaked with the saline solution, place the crock, now covered with a stoneware lid, into a boiler with water standing about three inches high, bring this to boiling-point slowly, stirring the mixture occasionally with one of the glass strips. Meantime prepare the following:

Nitrate of silver	1 oz. 60 gr.
Citric acid (powdered) . . .	95 gr.
Distilled water	10 oz.

The nitrate of silver must be dissolved in six ounces of water, the citric acid in four ounces, then added to the nitrate solution, forming a clear liquid. Now make up the following solution with hot distilled water:

Powdered alum	90 gr.
Distilled water	5 oz.

The temperature should be about 150° F. The gelatin, being now dissolved, should be well stirred so that no clots exist; remove the crock and allow it to stand awhile so that the temperature falls to about 130° F.; then, under the weak light of a gas jet, pour the acid silver solution in small quantities into the crock, stirring well at the same time with a glass strip until all the nitrate of silver solution has been added; now pour the hot alum solution into the mixture, in a gentle stream, and continue the stirring for a few minutes; add lastly one ounce of pure alcohol, known as photographic alcohol, this being well stirred in with the emulsion; the crock must now be covered and stood in a cool place to allow the emulsion to become thoroughly set.

If the emulsion is prepared during the evening it will be ready for washing in the morning. Although the emulsion thus prepared will keep for a day or two before washing, it will be found best to attend to this the following day. There will be no fear of discoloration from what is called the ripening operation, which in the case of gelatin means the combining of a portion of the nitrate of silver with the gelatin, forming an organic compound which for sensitizing celluloid it is better to avoid. The washing of the emulsion is accomplished as follows: Take a bone or hard-rubber paper knife; press it down the side of the crock; then run it around so as to loosen the solidified emulsion; lift the mass out and cut it into pieces with the bone knife by laying it upon a piece of clean oilcloth or a sheet of glass; place these pieces into a large basin of clean cold water (all these operations may be carried out under the light of an ordinary gas jet); take the crock that the emulsion was made in, half fill it with cold water, cut off a piece of the coarse canvas; place therein a few pieces of the emulsion; bring the four corners together and twist the cloth up tight, forcing the emulsion through the meshes, allowing the shreds to fall into the water; continue the operation until all the pieces of emulsion have been squeezed through the canvas. Now tie two pieces of canvas over the top of the crock; the cloth just used can be used for one; turn the crock over upon its side and let the water drain off; then fill the crock again with cold water by pouring it through the canvas. Repeat the operation three times, allowing ten minutes to elapse between each washing. Lastly, drain well; untie the canvas, wiping off any shreds of emulsion into the crock, and pour over the emulsion one ounce of pure alcohol. This will aid as a preservative. The canvas must be well washed and can be used several times. The emulsion is now ready for dissolving. Make up the filter by tying a piece of washed cheesecloth folded to four thicknesses over the small end of the lamp chimney, cutting off the spare ends; place in the chimney a piece of absorbent cotton pressed down upon the cheesecloth. Place the chimney, inverted, into a hole cut in a piece of board or shelf; beneath this place the stoneware pitcher ready to receive the filtered emulsion.

The next operation will be to prepare the celluloid. The sizes will depend on the photographer's requirements, and, consequently, the method of coating. Sheets of celluloid are usually supplied 20 inches wide and 50 inches long. Pieces 8 x 10 can be conveniently coated by laying them face down on the emulsion at about 120° F. A little skill is required in the manipulation so as to avoid coating the back as well as the front. If 8 x 10 is the size decided upon, then proceed to cut up the sheets of celluloid, which may be fifteen one-thousandths of an inch thick, or, if stouter material is required, there are twenty one-thousandths of an inch. Lay the sheet of celluloid upon the even top of a table or upon a large slate slab, which will be required for cooling purposes; mark off the sizes; place a straight edge from mark to mark, and draw across the tip of a sharp knife so as to nearly cut the celluloid through. Now double the end over; it will break with a clean edge. When the sheet is cut up, clean each piece with tepid water and rinse under a stream of filtered water; hang it up to dry with a push pin through one corner. As soon as all the pieces have been cleaned, coating may then be proceeded with.

Place the crock containing the emulsion into a vessel of hot water (half the emulsion may be used, if desired, to coat only a few pieces); bring the water to boiling-point; stir the emulsion well with a glass strip; add one ounce of pure alcohol with two ounces of distilled water and one ounce of nitrate of silver solution made up of fifty grains of nitrate of silver in one ounce of distilled water. If half the emulsion only is used, then only half the quantities given are necessary. The emulsion must now be poured into the filter. As soon as filtering is complete, the pitcher containing it may be placed in a pan of hot water. Take a clean porcelain tray, 10 x 12 will do. Wash this well in hot water and pour in the emulsion; stand the tray upon a piece of board; take one of the pieces of celluloid; wet the surface of it by pouring over it some tepid water, and drain well so that the surface is only slightly wet. Then lay it down upon the surface of the emulsion by bending the celluloid so that the middle touches the emulsion first; then lower each end. The celluloid may be lifted at once and drained at one corner into the tray against the side so that no air-bubbles are formed. The celluloid must then be laid down upon a wet level slate slab to set the coating. By wetting the slab the celluloid becomes perfectly flat by suction. Just as soon as the coating has become set, lift the piece of celluloid by one corner, allow the water to drain from the back and allow it to dry by hanging from a shelf, taking care that nothing comes in contact with the back. If there are any air-bubbles, they may be disposed of by touching the spot with a quill camel's hair brush. if there are a considerable number of these bubbles, then the emulsion is too hot; they are caused by the generation of a gas from the camphor contained in the celluloid. Should it be desired to coat larger pieces than 8 x 10, then another plan must be followed. In such a case, the sheet of celluloid may be cut into three pieces and a special frame made so as to hold the sheet of celluloid between the top and bottom halves of the frame, the top half having pieces of india rubber tacked on to form a bed for the celluloid to rest upon; then when the top half is pressed tightly down and held in position with hooks, a tray is formed into which the emulsion is poured, taking care in the construction of the frame to form a lip at one corner to pour the emulsion from. The frame should be well coated with shellac varnish and washed thoroughly after use.

Pieces of celluloid 16½ x 20 can be coated in this manner. Of course, there will be a waste of half an inch all round the outside. When coating by this method, the celluloid must be wetted after it is put into the frame, the water being poured off at the lip. Water at the ordinary temperature may be used in this case. When the emulsion has been poured over the surface a little tilting is necessary to secure even coating. Pour the emulsion each time through the filter. When celluloid is coated face up as in this case, very rarely will there be any gas-bubbles formed. As soon as the coating is complete, remove the celluloid by undoing the hooks; turn over the top half of the frame; then lifting it by opposite corners, lay it down upon the wet slab, allowing the middle to touch the slab first. By this means it will be drawn down flat upon the cold slab. The remaining emulsion may be kept for further coating if used within a week. The prepared celluloid when dry will keep in good condition for several months if kept from light and air. As soon as the coated celluloid is dry, it may be cut to the required sizes and printing upon it may be commenced. The progress of the printing can be watched the same as printing-out paper, but it must be well shaded when turning the celluloid back to observe the depth of printing. If this precaution is not taken the top portion of the print will become light-struck and the whites will become pink. The depth of printing must be carried only one shade darker than is required in the finished picture. The loss of depth is but slight in the operation of toning and fixing. After being toned in a gold bath, they may be toned in an acid platinum bath like almost any other silver print. The platinum toning must not be carried too far, or the resulting color will be a peculiar blue or purple blue.

When the prints have been made they must be well washed in a hard rubber fixing box (do not use a zinc washing box) by first wetting the print in a running stream of water, then placed in the grooves of the box, which must be filled and refilled with clean water half a dozen times. Do not try to wash and tone these prints like paper, or disaster will follow. They cannot be packed one on the top of another; the sharp edges of the celluloid will cut and scratch the prints. Toning must be carried out carefully, about four being toned at a time; then place in a weak solution of common salt to stop the action.

For gold toning the following modification of the borax bath will answer well:

Saturated solution of borax	4 oz.
Water	40 oz.
Solution of chloride of gold (one grain to the ounce)	3 oz.

Toning must not be carried too far; the slightest change in color is all that is necessary for good brown and sepia tones. As soon as toning is complete, proceed to fix in a bath of hyposulphite of soda three ounces, water twenty ounces. Fixing will require from fifteen to twenty minutes; this is necessary because the trace of nitrate of silver in the emulsion forms a compound with the zinc oxide or other material in the celluloid, which requires long fixing to become eliminated.

After the fixing process, the prints must be well washed again in the hard rubber box three or four times; then placed in an alum bath made up as follows:

Common alum (powdered)	4 oz.
Hot water	40 oz.

When cold, pour off the clean portion for use. This may be used many times over before becoming useless. Place the prints in this and let them soak for ten minutes; then remove them and wash in the hard rubber box half an hour, changing the water about a dozen times. After this the face of each print must be wiped with a tuft of wet absorbent cotton in a stream of running water; then suspended to dry by means of wooden clips, taking care to grip only a small portion of the celluloid.

Portraits can be vignetted perfectly upon this material—so perfect on the browns, purples and sepias by this process that many persons take them to be carbon prints; in fact, on several occasions they have been declared to be carbon prints upon celluloid. There is one important difference between a carbon print and one made by this process: the depth in the shadows is due to a more perfect reduction of the organic silver compound and shows no difference in the thickness of the deposit, while in a carbon print the shadows and dark portions of the print stand well out from the surface.

As to permanency, time alone can prove this. The writer has prints made by this process ten years ago that are just as perfect as when first made. Prints made by this process possess an exceptional delicacy and a wide range of color can be produced at will. Of course, like many new processes, those who take it up must make up their minds to become master of it. One minor difficulty was overcome in the toning process by making a wood tray coated with shellac varnish. Spaces were marked off 5¼ and 7¼ upon the bottom and small varnished wood pegs placed in so that each piece of 5 x 7 celluloid rested against these pegs when the tray was tilted, preventing the prints from sliding over each other. By this means any number of prints could be toned, up to one dozen.

Celluloid prepared in this way will be found to meet every requirement, for lockets, brooches, pins and other ornaments, and when mounted in an art frame, leather bound, it become indistinguishable from ivory. When colored in water-colors, it can be varnished by a thinned solution of amyl acetate collodion. The thinning is accomplished by the addition of amyl acetate. Such a covering makes a complete waterproof protection, so that if the print becomes soiled it may be wiped with a damp cloth. The varnishing of the print is not a necessity. They present a beautiful matt surface. When dried down after toning and fixing the spotting of the print must receive some attention, so as to get the color to match and be free from gloss.

Glossy surface collodion prepared by this process will give a little trouble by the film becoming loose and peeling off at the edges, so that an allowance should be made for this by an extra quarter of an inch all around, so that after drying and spotting the print must be retrimmed.

For general effect and superior finish, as well as artistic taste, the matt surface will be found to excel. Another plan for mounting is to first trim a 5 x 7 print so that there is about one-eighth of an inch of white margin; then use a strong paste brushed upon the back of the celluloid within three-eighths of an inch of the outside edge. The print can then be placed squarely in a folder. Place a piece of clean blotting paper upon the face of the print; then a 5 x 7 piece of clean glass, and lastly a two-pound weight. Allow to remain until the paste has become set. Glue may also be used, but not hot. Should there be any difficulty in getting the paste to adhere, rub the back of the celluloid over with a piece of fine sandpaper, wipe off the dust and apply the paste. This will overcome the difficulty and give no further trouble.

Toning Bromide Paper

A DIFFICULTY may at times be experienced in getting some particular make of paper to tone satisfactorily to a sepia color. The following bleaching bath gave me a very good rich sepia color with a paper that quite refused to tone at all with either the iodide or ferricyanide-bromide bleacher:

Potassium bichromate	45 gr.
Sodium chloride	240 gr.
Sulphuric acid	100 min.
Water	5 oz.

Transparencies for Window Decoration

I WONDER what has become of the once popular window transparencies? was the question asked recently by a writer. On reading this, I, too, began to wonder, for one seldom sees them now, although at one time, years ago, it was quite a common thing to see them in the windows of many houses. Is it that they are too easy to make, or has the hand camera, with its small-size plate, made it impossible to work in any size above a 3¼ square lantern plate? And yet one is as easy to produce as the other—in fact, it amounts to the same thing; we put our lantern plate pictures away in a box only to be brought out, perhaps, on rare occasions, but a window transparency we can have always on view. And what better way could we have of showing our work? There is no process that gives us so much value for our money; no print, not even carbon, can in my opinion reproduce the detail and gradation of a good negative in the same manner, for any picture viewed by reflected light must lose some of its finer points—they are covered up, but in a transparency we can miss nothing.

For those workers who have not yet tried their hand at transparency making I give below a few hints which I hope will bring a few recruits from among those of my readers who have hitherto confined themselves to paper prints, although more experienced workers will find an equal amount of pleasure in making these transparencies. There will be a good deal of what follows with which they will be quite familiar, having gone over the same ground when making lantern slides, and I must ask them to forgive me starting at the beginning.

Transparencies are contact or enlarged positives from a negative, and made on a glass plate coated with emulsion similar to the one on which the negative was made, but as we are not confined to a fraction of a second exposure we can use a very much slower plate with this advantage: a slow plate can be made to give a very much finer grain than a fast one, and we shall also be able to use a stronger light in the dark room to work by, which is a great boon.

We, therefore, procure a box of specially coated transparency plates; these can be had of many makes, and they are all good. We can take our choice, however, of bromide plates or "gaslight," the latter being a mixture of bromide and chloride, which is much slower and capable of giving various colors under a modified developer. We will make our first trial with the former and take a box of bromide transparency plates for black tones, and the same size as the negatives we are going to work from.

This brings us to the question of size, and, providing our negative contains all we want of our picture and no more, we can include the whole of it in our print, and, needless to say, the larger the better. In some cases, where we only want part of the negative, it is better to mask out the portions that spoil our composition, in the same way that we should improve a paper print by cutting off what we do not like.

To proceed, we take our box of plates, a printing frame, and the negative into the dark room. We can here, as I stated previously, use a good light, and the most convenient to my mind is a yellow hock-bottle lamp burning a candle, which will illuminate the room all round.

Now place the negative face up in the printing frame and on top of it place a very thin paper mask. This may be cut out of black "needle" paper, and should be wide enough to cover the outside edge of the negative, about a quarter of an inch all round, or in larger sizes it can be wider according to taste. On top of the mask face down place a transparency plate and behind this a piece of black paper, sufficient to protect the back of the plate from any light that may fall on the crack of the printing frame back, and finally we insert the back of the frame.

We are now ready to expose, and we can do this to a gas flame, and as it is possible to very much under- or overexpose, we advise some means by which we can measure the amount given. This would be easy if time were the only factor, but we have to bear in mind that the distance at which we hold the frame from the light is of equal importance.

So we will tie a piece of string to the gas bracket just below the burner and along it tie a knot about 12 inches distant from the flame. Now, by holding the knot between the fingers while holding the printing frame, we shall be sure to have our distance the same for each exposure; this will leave our question one of time only. And to determine this I should advise a trial exposure in strips in the following manner: Cover the front of the printing frame with a piece of card, leaving a strip exposed, say 1 inch wide, and give this two seconds, then draw the card along another inch and give another two seconds, and so on, so that if we make four exposures, the last will be two seconds, the others four, six, and eight. We shall then see after developing which is about right and act accordingly.

Before passing on to development, I wish to give two precautions which will save trouble later. One is, see that no dust is on the negative before inserting the plate, and the other is, avoid touching the sensitive surface of the plate with the fingers. Any portion so touched seems to acquire the property, possibly due to the natural oil of the skin, of repelling the developer, and markings result.

We are now ready to develop our latent image to a visible form. Everybody has his own special favorite in the developer line, and there is also a formula given on each box, which the maker of the plate recommends, and, as he knows what is best for his own goods, I should strongly advise using this; but in case any reader cannot adhere to one make of plates, and wishes to use one solution for all, I give the following formula, which has in my hands always proved reliable, is simple, and keeps well:

Metol	40 gr.
Hydroquinone	50 gr.
Sodium sulphite	2 oz.
Sodium carbonate	1 oz.
Water	20 oz.

and add one or two drops of 10 per cent. bromide solution to each ounce before use.

To make this up dissolve in the order named, but do not use all the water for the metol and hydroquinone. Dissolve these two in half, and the sodium sulphite in the other half; then mix and afterward add the sodium carbonate, for if you add sulphite dry to the first two in solution the metol has a nasty habit of leaving the solution and forming a powder at the bottom of the bottle.

To develop we proceed as in negative making, but the plate must not have the same appearance—that is to say, it must not be black all over as a negative is when carried far enough.

The right point to stop developing is best judged by looking through the plate at the light, and when sufficiently dense, after a slight rinse, we transfer it to the hypo bath; and here one word. Hypo is cheap; make it a rule to use a fresh bath for each batch of work. Stains are easier to avoid than to get rid of.

Fix the plate thoroughly—it is always well to leave it in the hypo as long after the milky deposit has disappeared from the plate as it took to go—afterward wash in running water for half an hour, and stand to dry where it will not get dusty.

Our transparency is now ready for mounting, and as the film side is still very tender we must protect it from scratches and atmospheric influences. The easiest way to do this is to place it face down on a clean piece of ground glass, and then bind the two together all round the edges with strips of paper; and here again there is room for personal taste. The binding can be supplemented with a frame, or lead and glass work mounting.

There are many ways of varying the color of our finished picture, which space forbids me to go into fully, but I give the following, which has given a novel effect in my hands within the last few days. The washed transparency was toned to a sepia by the method recently given in a contemporary as suitable for bromide prints, as follows:

It was bleached in a solution of potassium iodide:

Potassium	100 gr.
Water	10 oz.

then add

Iodin	45 gr.

And then, after well washing, it was toned with sulphur by immersing in

Sodium sulphite . . .	2 or 3 crystals
Water	4 oz.

The transparency was then well washed and dried.

The cover-glass was another transparency made from a cloud negative with the lower portion masked to give clear glass. This was toned blue by first soaking in

Potassium ferricyanide	1 dr.
Water	4 oz.

and after well washing, and again in

Ferrous chloride	1 dr.
Water	4 oz.

and again well washing before drying. The result was, to my mind, very effective.

And now a word about enlarging from small negatives for large transparencies. By enlarging I do not mean going to any great size, but, say, to half or whole plate, which, as a rule, will be quite big enough for a transparency to hang in a window.

In the first place, we want a good negative, not too dense, but free from blemish, pinhole, etc., for each of these will show far more in the larger size than they would in the contact print. Our mask may be placed next the negative or in contact with the plate, and I would suggest the latter, as then we are more sure of having the picture square on the plate.

Any of the usual means of enlarging may be used, but for this particular process a daylight enlarging camera is by far the simplest. We can then use the focussing screen and dark slide in the same way as usual when negative making and save the plate from any stray light that may be wandering around.

In the ordinary way an enlargement framed and hung on the wall is usually looked at from a distance, but in this case a transparency is often looked at close to, and, for this reason, we must get as sharp an image as possible—that is, for most subjects. There are some compositions, however, consisting of large masses of light and shade in which even a transparency would benefit by suppression of detail.

Before closing there is one method I have recently seen, by means of which transparencies may be made in a very cheap manner. A ferroprussiate print is made (it must be printed deeply, as we are going to look through it), and is rendered semitransparent by waxing or greasing it with poppy oil, castor oil, white paraffin wax, or vaseline, and either of the latter two I have found to answer well. Lay the print face down on a sheet of glass and rub the medium well into the back, until the paper has absorbed an equal amount all over, and then wipe clean with a piece of flannel. The print may then be mounted between two sheets of clean glass and treated in the same manner as a glass transparency. The blue color is, of course, only suitable for some subjects, such as sea and sky, or moonscapes, but if black is desired I have no doubt a platinotype print would serve, if treated in the same way, or there is a method given for turning the blue print into a black one.

But whichever way you go to work, give it a trial, and you will find the result an agreeable change from the usual thing.

Development of Ultra-rapid Plates

The *Photo-Revue* suggests the following developer for giving negatives with full detail, when using plates of the ultra-rapid type:

Water	100 c.c.
Anhydrous sodium sulphite	3 gm.
Diamidophenol . . .	0.5 gm.

The temperature of the bath should be 18° C., or about 65° F., and one should not be afraid of prolonging development until the whites become slightly veiled.

Another formula given contains hydroquinone alone, and is as follows:

Water (distilled) . . .	1000 gm.
Pure sodium sulphite . .	75 c.c.
Potassium carbonate . .	75 gm.
Hydroquinone	10 gm.
Potassium bromide . . .	5 gm.

This solution should be made up hot, and when ultimately used, one part of it should be mixed with three parts of water, if required for time exposures; otherwise it is employed in the concentrated form.

Coloring Photographs

We have had several inquiries lately about coloring photographs. We will probably give, later in the year, a few notes on miniature painting and on the working up of enlargements in color.

We give here a few examples on the simpler ways of coloring—useful to those who have not made a study of painting or drawing, but who may have a demand—or be able to create one—for tinted pictures:

There are two distinct methods of coloring prints—from the front and from the back—and of the two the former, if done with true artistic taste, is preferable; the latter, however, is much easier and requires absolutely no skill. The materials used may be either water or oil-colors, or aniline dyes, though if the latter are used great care must be taken to choose those that are stable.

The materials required are: Brushes. Red sables should be used for water-colors, not camel's-hair brushes; and for oils, one or two flat hog-hair of medium size, one or two smaller ones, one or two stumpy ditto, and one or two small flat sables. For water and oil-color painting the following pigments are permanent: Chinese white, light red, vermilion, carmine de Garance, madder lake, cadmium yellow, aureolin, cobalt, emerald-green, sepia, burnt sienna, raw sienna, lemon-yellow, ultramarine, terre verte, yellow ochre. For water-color painting these pigments can be obtained in the shape of powder and mixed with the following medium:

Clarified albumen . . .	1 oz.
Ammonium carbonate . .	20 gr.
Glycerin	20 min.
Ammonia	1 drop
Distilled water	¼ oz.

To clarify the albumen, obtain the whites of two eggs, beat to a froth, and allow to settle for twenty-four hours and filter; or obtain dried albumen from any dealer; of this, dissolve 20 grains in 1 ounce of water made slightly warm, add the glycerin and then the ammonia and carbonate dissolved in the ¼ ounce of water. Filter the mixture and keep in a stoppered bottle. Large quantities of this should not be made up as it soon decomposes; a preservative, such as boric acid, may be added to the above in the proportion of about 1 grain to above quantity.

Although water-colors obtained dry are generally used by advanced workers, the beginner should get the "moist" water-colors as being less troublesome to work.

For oil painting the tube oil colors should be obtained, and to thin them down meglip or medium should be used; a very good medium which dries quickly is mastic varnish, made by dissolving gum mastic 1 part in pure oil of turpentine 10 parts.

All those who have tried know how difficult it is to make colors take well to the surface of prints, and it is usual to prepare the surface in some way, and there are two methods: The first is to lick the print all over; the second is to use a solution of ox-gall. Purchase from a chemist the purified ox-gall, which is a thick greenish-yellow paste, and dissolve this in water and spirit. Sixty grains of the purified gall dissolved in 16 ounces of distilled water, and 4 ounces of wood alcohol added, will make a solution that will keep, and which can be applied to any print with a flat camel's-hair brush, and after this treatment, when dry, the print will take both oil and water-color readily.

After the surface has been treated the color should be applied, and for the delicate tints, such as those of the flesh, etc., a stipple or cross-hatch should be used, almost as in retoucing, and it is only in the deeper shadows that anything like deep broad strokes should be made. The photographic image will, if you allow it, at least with water-colors, always give you shadows and deeper shades, and it is only when the color is laid on too thick that difficulty will be experienced in obtaining the shades.

For enlargements it is advisable to mount on canvas with clarified fish-glue while both are thoroughoy damp, allow to dry, and then flow over the surface some size, prepared by dissolving 4 ounces of gelatin in 20 ounces of water by the aid of heat, and set up to drain and dry.

The foregoing methods all require considerable artistic skill, but the following can be done by any one, even by a child of about twelve or fourteen years of age; the only care required is to keep to the outlines of the printed image. It is more applicable to albumen than to gelatino- or collodio-chloride prints, because the supports of the latter are too thick. Obtain a fairly deeply printed albumen print, and soak in water until thoroughly limp, remove it, and blot off the superfluous moisture with blotting-paper. Procure a plain oak picture-frame the required size. Give the front of the frame a coating of fish-glue, and press down firmly on to the paper side of the print, lift the print and frame up, smooth the edges of the print on the frame, and use a roller squeegee to take out wrinkles or folds, then rear the whole up to dry; when thoroughly dry it can be prepared for painting.

Procure a good-size varnish-mop, some japanner's gold size and boiled linseed-oil, and mix the last two in equal proportions, and add one-eighth of the volume of castor-oil. Pour some of this mixture into a saucer and dip the varnish-mop into the same, and give the paper a thorough good soaking until the grain is scarcely perceptible and it is almost transparent; leave for twelve hours reared up against a wall in a warm place free from dust to dry. At the end of this time, with some clean dry blotting-paper, blot off any oil which has soaked through the albumen surface. The varnish should now be nearly dry, or so tacky as only just to hold the finger when applied.

Support the frame at an angle of forty-five degrees over a looking-glass laid flat on the table, so that plenty of light is reflected through it, and with the proper brushes begin to paint with the oil-colors, using mastic varnish as a medium. It is unnecessary to use any art; the paint of the desired tint is merely laid on in broad streaks, keeping only within the outlines, and the photographic image gives all the delicate play of lights and shades. It is astonishing how wonderfully effective are prints thus treated.

When the paint is dry on the back of the print a sharp knife run around the inner side of the frame will detach the picture, and it can then be mounted behind a cutout mount and framed if desired.

To color prints with aniline dyes is not a difficult matter. The real difficulty lies in obtaining stable dyes. For those who wish to attempt, the easiest way to set to work is to purchase some packages of the diamond dyes, which can be obtained at almost any store; turn the contents of the package into a 4-ounce bottle, and add 2 drams of glacial acetic acid and fill up with water. The acid not only helps to dissolve most of the dyes, but also acts as a good medium, for if the solution will not take kindly to any print, the addition of glacial acetic acid will immediately make it take. Such solutions should not be used too strong, and it is preferable to apply two washes rather than one deep one. Always allow one wash or color to dry before applying another over it or next to it, and if care is used there will be no running together. A selection of fine sable brushes should be at hand.

The Working of Development Papers

Each photographic printing process has its own particular details which must be mastered before the photographer can produce good results with certainty. These important details are, in general, the things which most easily affect the process—the things to which the process is most sensitive. In the growing of delicate plants in a greenhouse the most important details are temperature and moisture—it is to these that the growing plant is most sensitive. In the working of a photographic paper there are details, chemical and mechanical, which have very strong effects on the quality of the picture produced. In working developing papers the quality of the print depends first upon the quality of the developing paper on which it is made. The papers on the market vary considerably in their qualities, but the mode of working different papers is, in general, the same.

The first consideration is the developer. Metol-hydrochinon is the developer most generally used, and it probably gives better results, for general work, than any other developer.

The usual formula is:

Water	10 oz.
Metol	7 gr.
Hydrochinon	30 gr.
Sulphite of soda, dry . . .	110 gr.
Carbonate of soda, dry . .	200 gr.

Potassium bromide, a few drops.

This formula makes a strong developer and is generally used full strength for the slow contrasty working varieties of paper. It is usually diluted with an equal volume of water for developing the faster, softer-working varieties. Some workers develop both kinds of paper in a single developer, which may be either the strong developer or a weaker developer made by diluting two parts of the strong solution with one part of water.

The chemicals used are of considerable importance. Metol and hydrochinon usually come to us in a form that is sufficiently pure for all photographic uses, so that we need not make further mention of them. The quality of the sulphite is very important, as only by using good sulphite can pure black tones be obtained on developing paper. The carbonate of soda should also be pure, but there is little difficulty in securing carbonate that is of sufficient purity. Both the sulphite and carbonate should be "anhydrous" for the weights given to be correct. Crystal chemicals contain considerable water and hence are of lower strength than the anhydrous articles. The potassium bromide is employed as a 10 per cent. solution, and the quantity required varies with the brand of paper. Some workers change the formula by using more metol and less hydrochinon for producing softer prints without changing the grade of paper. The hydrochinon may even be left out entirely by increasing the amount of metol in the formula to 30 grains for the softest effects. Some papers will produce better prints by reducing the amount of carbonate of soda in the formula to 150 grains or even to 125 grains.

The amount of bromide required in the developer depends upon the grade of paper and the tone desired in the finished print. The bromide is put into the developer to keep the high-lights of the print clear, that is, to keep unexposed portions of the print from fogging over in the developer. If a piece of unexposed paper is immersed in a developer without bromide it will speedily become gray all over. We must add to the developer sufficient bromide to keep the whites of the print perfectly white during the time required for developing the prints. The amount can be readily determined by adding a little bromide at a time and testing with a slip of unexposed paper, until the slip will remain perfectly clear for thirty seconds' immersion in the developer. This developer will then (on most papers) give prints of a blue-black tone with clear high-lights. If, now, we add a little more bromide, we will secure prints of pure black tone, and if still more bromide is added the tone will be a greenish, brownish black. The pure black tone is most pleasing for the majority of subjects, but the blue-black is often preferred for seascapes and pictures containing considerable evergreen foliage. The greenish-black is also liked by some workers for particular effects.

In order that the paper and developer may work in this way it is very important that the developer be clear, colorless and undeteriorated—it is best freshly prepared. Also, most of the developing papers on the market will only work in this way when fairly fresh. After they are several months old, a very large amount of bromide is required to keep the whites clear, and for this reason pure black or blue-black tones cannot be obtained on old paper. There are, however, a few makes of paper which will keep in a perfect condition for a year or more.

The time of development is also important. Of course, we must develop the print until it is dark enough, but we can change the time of development by changing the exposure. Most papers give the rest results by exposing so that the print will develop in from twenty to thirty seconds. In general, the contrasty papers develop quicker and the soft papers require slower development for good results. If development is too quick the print will be flat and lacking in brilliancy. It will also not have the pure tone that is secured by longer development. If exposure is too short and development too long (forced development) the whites of the print will be veiled over, the high-lights will be muddy and flat. The correct time of development for best results will depend upon the strength of the developer, also somewhat upon its temperature, and upon the amount of bromide it contains. The greater the amount of bromide the longer the time of development. By this, we do not mean that each print will be developed by the watch, exactly so many seconds, but that the exposure will be so timed that development will take place in about that number of seconds. The print will be developed in the usual way, until it appears dark enough. The exposure varies with the nature of the negative.

Other developers may also be used for developing papers. Amidol developer gives excellent results, and the following formula is about right for most papers:

Water	10 oz.
Sodium sulphite, dry . .	180 gr.
Amidol	30 gr.
Potassium bromide, as necessary.	

The amount of bromide is best determined by trial, as just described, for M. Q. developer, and will vary considerably with different papers.

Artol may be used in combination with hydrochinone. The formula may be the same for M. Q. developer, but substituting the metol by *twice* the quantity of artol.

Some workers immerse the print in water, previous to developing, but the writer usually finds it more convenient to immerse the dry print directly in the developer. This is easily done, by having a generous quantity of developer. The print must be flowed completely with the developer when first immersed, to avoid streaks and air-bells.

When the print is removed from the developer, it is rinsed quickly in water and transferred to the fixing bath. Some workers use, instead of water, a dilute solution of acetic acid, say a half-ounce to the quart. This checks development instantly, and is an excellent preventive of stains.

When first immersed in the fixing bath it is very important that the prints be immersed instantly and completely, and be kept moving for a few seconds. If this is not done, yellow stains will form on the prints. A very convenient way to immerse the prints is with an inverted glass funnel, the stem of the funnel being used as a handle. In the absence of a funnel a wooden stick may be used. The funnel must not, however, be left resting on the prints in the fixing bath or it will cause dark circles on the prints where it comes in contact with them.

For the fixing bath, plain hypo may be used, of a strength of 3 ounces to the pint of water, but the acid fixing and hardening bath is so much superior, and so inexpensive, that the wise photographer will always use it.

The following formula produces an excellent bath:

Water	64 oz.
Hypo	16 oz.

When dissolved, add the following acid hardening solution:

Water	5 oz.
Sulphite of soda, dry	¼ oz.
Acetic acid	3 oz.
Powdered alum	½ oz.

It should be used until each pint of the bath has fixed the equivalent of half a gross of cabinet or 4 x 5 prints and then should be thrown away. The bath is so cheap, it is wiser to waste a pint of it than to lose a single print by improper fixing.

Developing papers fix very rapidly, much more rapidly than is generally supposed. The prints are usually completely fixed in one or two minutes, but we can generally leave them in the bath for ten or fifteen minutes without the least inconvenience, and this time will make complete fixing absolutely certain.

The washing, after fixing, to secure complete removal of hypo, must be very thorough, for if the hypo is not completely removed the prints will turn yellow with age. If there is plenty of water and a good stream running, a half hour's washing will be sufficient provided the prints are kept well separated. Of course, if they are allowed to pack together, the water cannot remove the hypo. Longer washing does no harm, and the writer has frequently washed prints all night with no ill effect. The prints were, however, well hardened in the acid fixing and hardening bath.

After washing, the prints may be spread out, face up, on newspapers or cheese-cloth stretchers to dry. The writer prefers to make a pack of the wet prints on a glass plate and squeeze out the surplus water, then placing the damp prints between blotters to dry. In this way the prints come out perfectly flat. It is necessary, however, that they be well hardened in the acid and hardening bath, or they will stick to the blotters.

Some workers allow the prints to dry face down on cheese-cloth stretchers or on blotters. Dried in this way they do not curl so much as when dried face up, but they are always somewhat cockled and never perfectly flat, as when dried between blotters. Another way that has been occasionally suggested is to provide a long, wide strip of cheese-cloth and a large wooden cylinder or stoneware crock on which it may be conveniently wound. When the winding is started the prints are placed between the layers of cheese-cloth, face out. They are thus dried in a position that tends to counteract the natural tendency of prints to curl, face in, in drying.

Prints on glossy developing paper have more tendency to stick to the blotters or cheese-cloth than matt-surface prints, but the difficulty may be overcome by using a strong acid fixing and hardening bath, which will harden the film and remove the sticking tendency. They may, of course, be dried face up, even if not hardened. The method used in drying glossy gelatin prints, by squeegeeing on ferrotype plates, may also be used for glossy developing prints, and when removed from the plates the prints will possess a beautiful brilliant lustre.

The trimming of developing prints is no different from trimming any other prints, but some workers do not trim the print at all. They simply print with a white margin and carefully place the sheet on the negative by guide marks so that the white margin will be uniform all around the print. Then an acid fixing and hardening bath is used, which hardens the film so it does not "frill" around the edges of the prints, and trimming is not necessary.

Developing prints may be mounted wet, like prints on any photographic paper. A method of dry mounting is, however, sometimes employed, which enables the prints to be mounted on thin cards without cockling. Prints for dry mounting should be dried between blotters, so as to be perfectly flat. The dry print is placed face down on a sheet of paper, and with a stiff brush the paste is applied all around the edges of the print, the pasted edge being about one-fourth inch wide. The paste used for this purpose must have very good adhesive quality. Some varieties of prepared white photo paste serve the purpose very well, and hot glue may also be used. The pasted print is quickly transferred to the correct position on the mount, a clean sheet of paper placed over it and the squeegee roller applied. Or the whole may be put under a weight for a few minutes, until the paste adheres. This method of mounting requires a little practice, but it very successfully accomplishes the mounting of prints on thin cards without cockling. The kodak dry mounting tissue also offers a clean and easy method of dry mounting, the paste pot and brush are replaced by a hot flat-iron.

Intensification: The Best Method

INTENSIFIERS, like developers, have appeared in bewildering numbers since dry plates are in use. Which is the best for all-around purposes?

The writer has tried about all intensifiers or intensifying methods that have become prominent since the appearance of dry plates and seemed worth trying, and, after many experiments, decided years ago on using a certain method of intensification which, at least for his own purposes, he considers the best for negatives, lantern slides and bromide papers.

Some intensifiers give more intensification than one occasionally knows what to do with; others exaggerate the contrasts to an unpleasant degree. Some require a most careful manipulation, and a little oversight results in failure and spoiling of the negative, slide or bromide paper. Some give but little intensification, and a repetition of the process improves matters little or not at all. Some methods of intensification can be used but once, and if the result is unsatisfactory, there is nothing else to be done but to be content. After the use of some intensifiers, reduction, if desirable, is out of the question. Some intensifiers are inclined to stain the film or spoil it later. Some intensifications are not stable but change in the course of time, usually for the worse. Some intensifiers may do for negatives but not for lantern slides or bromide papers. Some methods of intensification require more time and patience than average human beings have at their disposal, and some are so filthy and nauseous that they should be used only in back yards, where filth and stench would be less objectionable than in a room.

An all-around good method of intensification ought to have the following qualifications: It ought to be cleanly enough for average civilized people, and easy enough so as not to rile one's good humor. It ought not to include too dangerous poisons. It ought to give a fair, proportional, and certain amount of permanent intensification. It ought to leave the film clean and clear. It ought to be possible to repeat the process as often as necessary, and to reduce the intensity, if desirable. An all-around good method of intensification should be applicable not only to negatives but also to lantern slides and bromide papers.

After various experiments the writer has found about every one of the generally recommended intensifiers wanting in some one or other of the qualifications just mentioned. The one method of intensification which comes nearest up to the ideal of the writer is that advocated by Chapman Jones, were it not for the practical difficulties attending it. Mr. Jones says in his *Introduction to the Science and Practice of Photography*, page 201, London, 1895: "The only method of intensification that is theoretically and practically simple, that gives an image of known and stable composition with a substantial but not too great an increase of density, that may be repeated any number of times upon the same negative so that any density may be obtained in the end, and that can be depended upon in every desirable way, consists in the application of ferrous oxalate to the image bleached by mercuric chloride."

Mr. Jones has thoroughly investigated the subject of intensification and may be considered an authority on the reliability of the mercurial method of intensification; but his particular process presents some practical difficulties, which, no doubt, others beside the writer have found. "Ferrous oxalate, though possibly the theoretically correct blackening agent, is of little or no value practically." To use ferrous oxalate for the purpose indicated, it would be necessary to have a quantity of distilled water on hand, which many have not got, and to use extra trays and an extra room or place, so as not to get any of the iron solution where it is not wanted.

In searching for the best method of intensification it would seem to be advisable to adhere to mercurial intensification and to look for another blackening agent that possesses the good qualities of ferrous oxalate without its practical inconveniences. Quite naturally the use of ordinary alkaline developers suggest itself to take the place of ferrous oxalate. "Such procedure," says Mr. Jones, "certainly leaves a pure metallic image; but in no case with a great number of different formulæ tested by the author was the whole of the metal left behind. Generally, from 20 to 40 per cent. of the mercury was dissolved out by the developer."

Even if so, a good and permanent mercurial intensification of from 60 to 80 per cent. was gained.

Now the question is, may not an alkaline developer be so compounded as to reduce the loss of mercury to practically unnoticeable proportions? What ingredients of the developer dissolve out mercury? It seems to be the sulphite and the sodium carbonate, and it seems to the writer that these two ingredients may be sufficiently reduced so that they cannot dissolve out much mercury during the comparatively short time the backening is going on. Acting on this view, the writer years ago adopted substantially the following method of intensication, and has found nothing better since.

First bleach the film in the following solution:

Mercury bichloride . . .	2 dr.
Potassium bromide . . .	2 dr.
Water to make	16 oz.
Hydrochloric acid . . .	16 drops

This solution is easily prepared, or any good druggist will prepare it. It keeps indefinitely, especially if kept in a dark place or if some dark paper is wrapped around the bottle. Put as much of the solution as is required into another bottle and use it as long as it works sufficiently well. When it begins to work too slowly, pour off about one-half of the used solution and add as much again from the unused solution.

After the plate is bleached give it one washing, then put it into a strong solution of common salt for about three minutes. This seems to have a clearing effect. After this give it yet about three washings at short intervals.

Next pour on the following developer:

Hydrochinon	1 gr.
Sodium sulphite	4 gr,
Potassium bromide	1 gr.
Acetone	5 min.
Or, instead of acetone, sodium carbonate crystals . . .	2 gr.
Water to make	1 oz.

If it should seem necessary, add later the same amount of hydrochinon with sulphite and acetone, or sodium carbonate, as indicated above, but no potassium bromide. This developer is easily prepared and keeps well in the following separate solutions:

Hydrochinon, 1 grain; sulphite, 4 grains; water to 1 dram or 60 minims.

Sodium carbonate and potassium bromide each in 1 to 10 solution.

Like the bleaching solution, the developer may always be kept on hand ready for immediate use. After redeveloping the plate or bromide paper, give yet three washings at short intervals, then dry it.

Some Points in Copying.—III

To copy "prints" and engravings satisfactorily it is well to know something of the nature of the originals. Engravings (and what a dealer calls "prints" are usually engravings of some kind) may be divided into those printed like type and those which are intaglio printed. Wood cuts and wood engravings are printed like type, that is, the raised parts of the block receive the ink from the roller and transfer it to the paper. The blocks resemble, in fact, a rubber stamp. Such prints are absolute black-and-white, and the tones of the picture are obtained by the width of the lines and their closeness together. Intaglio plates, on the other hand, are of metal, steel or copper, and have lines or holes cut, or etched, into their surface. Some of these lines or holes are deep and broad, others shallow and fine. The plate is covered with a thick greasy ink, which fills all the lines, and the ink is then wiped off the surface of the plate in various ways, sometimes completely, sometimes incompletely, but always in such a way as to leave the lines or holes full of ink. Damped paper of a proper quality is then placed in contact with the plate, and the two are passed through a copperplate press. The paper picks out all the ink from the lines, etc., and the "impression" is thus obtained.

Now note that if the surface of the plate is wiped clean, as in the case of what is commonly called a "steel engraving," we have again clear lines in all the lighter tones and the half tones (these tones being produced by the width and closeness of the lines), but in the deep shadows or dark tones the lines, though usually still distinct, are connected by a tint, really ink which has run out of the deeply-cut or etched lines. All this may be seen with a pocket magnifier on almost any decently good steel engraving. The *effect* may be explained, perhaps, in this way. Make a drawing with the pen on smooth white paper. The image is entirely built up of lines. But it is decided that the shadows are not dark enough, and a little diluted ink is run over them with a brush. The area is darkened though the lines are still visible.

But in etchings this effect is often carried further. Some of Whistler's plates, printed, we believe, by Mortimer Menpes, and printed *cold*, give a clean, delicate, pure line. But most etchings are printed with the copperplate warm, and this warming softens the greasy ink and helps the production of a tint. The plate is seldom wiped clean, and the printer (who must be an artist, in perception at all events) decides which parts will be most cleanly wiped, and where he will leave a good deal of ink to produce tint. Finally, he draws very delicately across the warmed plate a piece of soft butter muslin, and this drags out of the lines a trace of ink, leaving this trace deposited on the surface of the plate between the lines. This is known as *retroussage*. This effect, then, is analogous to the use of a wash of diluted ink on *any* part of the pen-drawing which it is wished to darken or enrich, or which might be improved by tint added to the line, or even washes of varying strength over the whole.

Mezzotints, aquatints, and photogravures are made up of tiny dots of irregular shape and size, the *grain* being so fine that the effect of tint is produced. Lithographs, produced in quite a different way, give tint effects, and are finer still in grain or even grainless, and more like washes of water-colors.

We have given these very elementary details because, as far as possible, the photographic copy should show the characteristics of the original. Obviously the lines, dots, or grain of a print 20 by 16 will not be visible in a copy made on a half-plate, but where the scale is the same, or nearly the same, the characteristics should be retained to as great an extent as possible, and to do this the photographer should know approximately what those characteristics are. A table may be handy for reference:

PRINT	CHARACTERISTICS
Wood engravings Wood cuts	Lines, crossed in places, sometimes masses, black with white interspaces
Steel engraving . . .	Line or stipple, or both, tint in shadows
Stipple engraving . .	Irregular dots (prints often hand-colored)
Aquatint etching . .	Irregular grain (prints sometimes colored)
Mezzotint	Irregular grain, showing dots blended by some tint, usually very rich and strong effects
Etching	Lines, usually with tint produced in printing
Dry point etching . .	Lines, very rich in quality, due to the burr raised by the steel needle or diamond point
Lithograph	Tint, almost if not quite grainless

To secure these dots, lines, etc., in the copy. it is first necessary to focus very carefully and, usually, to employ a small stop. If an R. R. lens is being used this is necessary to get definition at the margins, and many anastigmats have sufficient spherical aberration to prevent their being used for such work at anything like full aperture. An eyepiece should be used in conjunction with the finest acid-etched screen, and the image must be examined in every part, not merely in the center and edges. Plates must be "process," and if the paper is at all yellow, as it may be without appearing so, an ortho-process plate should be used. Large plates present some difficulty, but better results will be obtained if the plates are desiccated before exposure. For small work an electric hot plate may be used, and for large ones a drying cupboard, if one exists, or can be fitted up, so as to be free of gas fumes. Drying would seem to make film thinner, and so there is less loss of definition through irradiation, and we believe density is more easily obtained.

Development presents a difficulty. If the subject is a woodcut the development time is immaterial so long as the black lines remain clear glass and the white spaces are developed opaque enough to print white. But where there are both line and tint, development must be gauged very nicely, and we think trials on the time and temperature method the only safe way.

When dealing with pencil drawings, their soft grayness and delicacy should not be lost sight of. There is some risk of getting too strong a negative on the process plate, though it is probably the best plate to use. But any print which suggests an ink line may be regarded as a failure, for not only is the characteristic of the original lost, but as pencil gives gray tones of varying strength and delicacy, some of the lighter ones are sure to be lost if the development is overdone. We are inclined to think that some slight recording of the texture of the paper is an advantage when anything other than a Bristol board surface has been used for the drawing.

As we hinted in the first article, legal and commercial copying should receive attention. A photograph will often show an erasure about which one cannot feel certain in ordinary examination, and it would be well to make a few experiments in copying writings containing erasures. Much depends on the angle of lighting, and in general the copy should be made on as large a scale as possible, microscopically sharp, and enlarged two or three diameters on smooth or glossy paper.

Copying so as to get rid of some stain in the original has been alluded to. For this we must employ a contrast filter, which may be of any required absorption, or popularly, of any color. Take a white envelope, with a penny stamp attached, into the dark-room. The stamp becomes practically invisible. Why? Because the whole of the envelope is reflecting red light, the color of the stamp. The same effect is obtained if a red filter is laid over the envelope in daylight. A photograph of the envelope taken through the red filter on a panchromatic plate would similarly obliterate the stamp. This is the key to the use of contrast filters for stain removal, the absorptions of stain and filter must agree. A great deal can be done with the tri-color sets, red, green and blue-violet, and a Kiii., but a liquid-filter, which may be modified as required, is an advantage. It must be remembered that if the stain is obliterated in the copy everything else of the same color will be obliterated also. When using a blue filter an ordinary plate may be employed, but in other cases a panchromatic plate is the best unless the stain is a not very deep yellow, when an ortho, is all right. We have referred to a "stain," but obviously the same treatment may be applied to writing in colored ink, and so on. Annotations made in red ink would be lost in the copy exposed through a suitable red filter, just as a red stain would be.

If it is desired to lighten any color in its monochrome translation the same rule may be applied. We have a blue and yellow poster, which photographed on an ordinary plate is recorded with the blue too light and the yellow too dark. Using a blue filter this effect would probably be intensified, the blue might appear as white and the yellow as black. But using an ortho plate and a deep yellow filter the blue would appear dark and the yellow probably almost white. The use of a contrast filter in this way must not be confused with color correction. It is an arbitrary control of tones for some specific purpose.—*B. J.*

(*To be Concluded*)

Replenishing Cinematagraph Tank Developers

A GREAT deal of difficulty is experienced in all cinematagraph laboratories in maintaining a constant reducing potential in the developer. The reduction rate or velocity of the developing solution is lowered by three primary causes, as follows: (1) The decrease in the volume of the developer by the racks carrying a portion out each time one is removed from the tank, which is from time to time compensated for by adding water to bring the solution up to a level that will cover the racks during development. (2) The oxidation of the solution by the photographic process of reduction. Reduction is here referred to as the diminishing of the valency of a metal, or the diminishing of the charge on the cation which is necessarily connected with oxidation or the reverse as the increase of the valency of a metal or increase of the charge on the cation. This can be illustrated in the case of iron development, as —$Ag^1 + Fe^2 > Ag(met) + Fe^3$, and if the expression R is used to represent an organic developer, then it would be $Ag^1 + R > Ag(met) + R^1$. In the above Ag^1 represents the silver salt about to be reduced as AgBr, and Ag met. represents metallic silver or the developed image. In the first case the valency of the silver metal is reduced from unity to zero, while the valency of the iron is raised from two to three, and the charges are likewise effected, since both are cations—the anions being omitted for simplicity. Thus for each rack of film developed in a tank the developing potential is materially reduced, thereby decreasing the velocity of development, which can be compensated for up to a certain point by increasing the time of development. (3) Decomposition of the developing solutions itself through the agency of oxygen from the air. All of the organic developers now in use commercially are but very feeble reducers in acid solutions but very energetic in alkaline solutions, although in alkaline solutions they are readily attacked by the oxygen of the air thereby oxadizing them into compounds having no developing power at all.

It is customary in many laboratories to restore temporarily the developing power or velocity of the solution by adding to the tank concentrated solutions of sodium carbonate, sodium hydrate, stock developer with varying quantities of sodium sulphite and potassium bromide, thereby economizing on the cost of a fresh developer. However, in so doing, the developing solution becomes concentrated in the products of decomposition, as sulphites, sulphates (from oxidation of sulphite and as an impurity in commercial sodium sulphite sometimes equal to 26 per cent. of the weight), carbonates and bromides of the metals sodium, potassium and calcium (from the tap-water used in making up the developer) with the products of ultimate decomposition of the developing agents, which are presumed to be carbon dioxide and ammonia.

The sulphites plus the thiosulphate (hypo) and potassium ferricyanide, carried into the developing solution on the insufficiently washed racks customary in all laboratories, are solvents of silver bromide. The solvents have a tendency to dissolve the silver bromide, which wanders through the gelatin somewhat and is reduced by the developer as a collodial deposit of metallic silver, with color which is well known under the name of dichroic fog.

This stain can be somewhat overcome by overexposure and short development, since prolonged developing seems to increase the stain while film exposed to the same light would develop without any sign of stain in a freshly prepared developing solution. Prints obtained in this manner are generally wanting in brilliancy and very much inferior to those obtained by correct exposure and development in a freshly prepared developer.

In laboratories where it is necessary to economize in the cost of developer it would be advisable to paint the racks with an asphalt paint or a celluloid lacquer. It has been customary in many laboratories to paraffin the racks, which is, however, very difficult to do so as to obtain a coating thin enough that will not crack and come off. A celluloid covering, as obtained by applying a lacquer, would perhaps be the best solution from a chemical standpoint, but possibly under some conditions would give rise to trouble from static in winding the racks.

R. Bruce Archey.

Photographing Dogs

The photographing of dogs for illustration or other general purposes sometimes falls to the commercial photographer, and a few hints about this specialty may be useful. As far as we are concerned here, the work will be largely confined to "show dogs" on exhibition, or dogs at kennels or country houses.

A certain amount of familiarity with dogs, and their points, differences of breed, characteristics, etc., is helpful, if not essential, to success. Patience, quickness of observation and a genuine interest in the results are absolutely necessary.

Dogs are as sensitive as children about new faces and strange voices, and they are quite as quick to analyze the spirit of the photographer. Then we will often have to contend with the owners. Speaking of these points, Mr. W. H. Mapes, an experienced worker, says truly: "Most dog owners want the picture to show the ears erect and the animal on the alert, just as a great many people insist on having children taken full-length, standing, And this notwithstanding the fact that many dogs—pugs and spaniels especially—are so fat and lazy from overfeeding that they can hardly move, and seem threatened with heart-failure every time they climb a flight of stairs. The most frantic efforts on the part of the photographer will hardly rouse such subjects from their state of torpor, or cause more than a few sleepy winks or a stupid stare. When it is my lot to get such a subject to work with, I proceed to handle him without gloves. I growl, bark, yelp, slam doors, cry like a cat and scratch parlor-matches until the animal is actually tortured into some semblance of interest and activity.

Other dogs—the nervous, intelligent fox terrier, for example—will hear and respond to the slighest sound, and are so quick that I have spoiled many exposures by opening the shutter too quickly and causing the flaps to rustle, and the dog to instantly change position. Fox terriers require the most expert handling. A slight scratching on the camera box or the crumpling of a piece of paper in the hand is usually sufficient to fix their attention and enable their owner to get out of range of the instrument; and often the sight of a rubber ball will throw them into a jaunty, saucy position, which is superb in showing the characteristics of the breed; for a photograph of a dog, whatever the breed, must show that he has blood of good quality in him, must show his style, his carriage, and his good points, or else it is but little more than a failure.

Setters and pointers are best posed with a kitten or pigeon to fix their attention. Their owners usually ask that they be taken at a point, but in all my experience I have never yet seen one in front of the camera take a perfect point. There is always something a little different from what it should be that impairs the quality of the picture and causes disappointment. It is quite necessary that the dog be well trained in using live objects to attract him, for otherwise he may create havoc with the backgrounds and accessories, if in the studio, in his attempt to seize the object. I once saw a Great Dane dog knock a trainer down in his attempt to seize a kitten which the trainer was holding, and which escaped only by climbing a tree. Newfoundlands and mastiffs are generally easy to handle, and bull terriers likewise, but the best dog of all to photograph is the Scotch collie."—E. J. Davidson.

l.57. No.4 April 1920 20 Cents

The Photographic Journal of America

Smithsonian Institution
APR 12 1920
National Museum

Published Monthly
With Illustrations

Efficiency in the Printing Room

can never be obtained with make-shift or antiquated equipment. A reliable, scientifically correct, modern printing machine is essential in the production of work of highest quality.

The ANSCO 11 x 14 Professional Printing Machine is designed for general use. It is easy to install, economical to maintain and uniformly dependable as to light.

PRICES and full description of this Printer and other ANSCO professional apparatus for photographic studios will be mailed on request.

ANSCO COMPANY
BINGHAMTON, N. Y.

NEW YORK
129-131 West 22nd St.

SAN FRANCISCO
171-173 Second St.

CHICAGO
308 N. Michigan Blvd.

TORONTO
347 Adelaide St., W.

THE PHOTOGRAPHIC JOURNAL *of* AMERICA

REGISTERED IN THE UNITED STATES PATENT OFFICE

NEW SERIES: WILSON'S PHOTOGRAPHIC MAGAZINE

AN ILLUSTRATED MONTHLY DEVOTED TO THE SCIENCE AND ART OF PHOTOGRAPHY

THE OLDEST PHOTOGRAPHIC MAGAZINE IN AMERICA
Founded 1864

Incorporating:
The Philadelphia Photographer **The Photographic World**

THOMAS COKE WATKINS, Editor

CONTENTS FOR APRIL, 1920

The Child in Photography . . . . R. H. S. 131
Photographing Upon Wood for Engraving Purposes. Part II . . Alfred J. Jarman 134
Standing Positions . . . . Sidney Allan 139
Optimism 142
Editor's Table—The Prime Essentials 143
The Studio—Practical Papers on Studio Work and Methods 144
Views and Reviews 149
Among the Societies 151
The Workroom 155

YEARLY SUBSCRIPTION, in advance, postage paid, United States, Mexico, Cuba, Philippines and Porto Rico, $2.00; Canada, $2.35. Countries in the Postal Union, $2.75. Single copies, 20 cents.

REMITTANCES may be made at our risk by money order, check, draft, or registered letter.

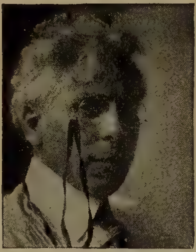
SUBSCRIPTIONS begin with current issue.

Published by EDWARD L. WILSON COMPANY, INC.,
THOS. C. WATKINS, President. **701 Arch Street, Philadelphia, Pa.**
EXECUTIVE and EDITORIAL OFFICES, CAMERA BUILDING, 122 EAST 25th ST., NEW YORK CITY
HOUGHTON'S, Ltd., London, Eng., Agents for Great Britain
American News Co., Distributors for U. S. Kodak Australasia Ltd., Sydney, Agents for Australia
RICHARD HILL, Devonport, Auckland, Agent for New Zealand

Entered at Philadelphia Post-office as Second-class Matter

This is one of a series of sketches on Leading American Photographers

American Photographers



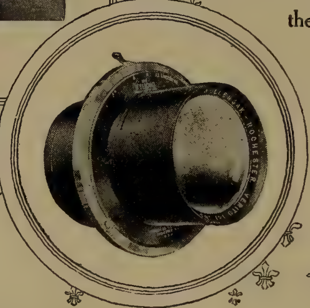
FRANK SCOTT CLARK—Winner of the Gold Medal at Dresden in 1909 and the Diamond Medal at Winona, former President of the Ohio-Michigan-Indiana Photographers' Association and president of the Scarab Club (the Art Club of Detroit)—these are only a few of the accomplishments of Frank Scott Clark.

It is not surprising to find Mr. Clark actively engaged in the activities of his local art club. In his paintings, which have been accepted and hung in the Art Institute, the same excellent technique is evident that has established his fame in the photographic field.

Ten years ago Mr. Clark bought the first Verito that we manufactured, and he has used it ever since. We think that the wonderful opportunity that the Verito presents for artistic distinctiveness and variable diffusion in portraiture has contributed in a small way to Mr. Clark's remarkable success.

When a man like Frank Scott Clark finds the Verito Soft Focus Lens meets his requirements for practically all of his work, is it not evident that the lens will prove of real value to you?

We will be pleased to send you our beautiful illustrated catalogue gratis which fully describes this as well as our other popular portrait lenses.



The Verito F:4 is furnished in Barrel or Shutter. Focal lengths up to 18". Suitable for studio, Graflex or enlarging, where pleasing softness is desired.

WOLLENSAK OPTICAL CO.

ROCHESTER, NEW YORK.

AMERICAN MADE REXOLON **DEVELOPING AGENT**

Rexolon is a new universal developing agent. Rexolon offers unusual, distinctive and important advantages over all other developing agents.

1. Rexolon is chemically pure and lasting.
2. Rexolon is distinctive for the non-oxidizing qualities. It will stand in an open solution twice as long as German metol
3. Rexolon is non-poisonous to the skin, a characteristic which will appeal to all subject to metol poisoning.
4. Rexolon is a soft developer, greater contrast can be obtained by the addition of bromide, which within certain limits does not affect the tone.
5. Rexolon will produce good blacks and whites even if the negatives are under or over exposed.

Rexolon is being rapidly stocked by all photo dealers. It will pay you to give it a trial.

Put up in one, four and eight ounce bottles, also in one pound bottles.

One ounce bottle........................$1.35

CHICAGO - Burke & James Inc - NEW YORK

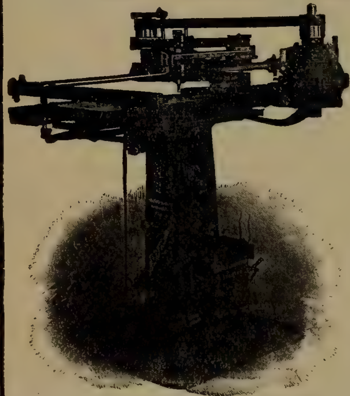


PLATE FINISHING

machines for the photo-engraver. Carefully and expertly constructed to give pleasing continuous service and the most practical advantages. Every operation provided for.

WRITE FOR PRINTED MATTER

JOHN ROYLE & SONS, PATERSON, N. J. U. S. A.

Routers, Lining-Bevelers, Saws, Trimmers, Router Cutters, Etc.

By L. J. BUCKLEY
BINGHAMTON, N. Y.

The
PHOTOGRAPHIC
JOURNAL
of AMERICA

VOLUME LVII APRIL, 1920 NUMBER 4

THE AUTHORITY FOR THE PROFESSIONAL PHOTOGRAPHER
FOUNDED 1864

Smithsonian Institution
APR 12 1920
National Museum

THE CHILD IN PHOTOGRAPHY

By R. H. S.

HAND-IN-HAND with the advance of science we witness a constant unfolding of new possibilities in the realm of photography. It is, above all, thanks to the untiring efforts of the amateur, that the suggestions of the scientist are being utilized by the experimentalist, to produce those new and characteristic methods of representation, the scientific and educational value of which are incontrovertible.

At the present day more and more use is undoubtedly being made of these modern methods of illustration, in conjunction with the newest processes in developing; and for this there exists no more suitable field of study than that furnished by the everchanging aspects of childhood.

The fact that a large number of photographers still shrink from undertaking child-photography is to be attributed to an exaggerated idea of the difficulties connected with this work, rather than to a lack of interest in the subject itself. Nevertheless, in spite of occasional happy results produced in this line, it is absolutely essential, in order to ensure success, that cameras be supplied with the best optical and mechanical equipment.

A disturbing background frequently suffices to discourage the photographer from undertaking a picture; for this reason it should be mentioned that a good photograph can be obtained even without an artistic background. Moreover, it should be borne in mind that a picture furnished with such an artistic background, even though possessing superior technical accuracy, cannot be said to be improved by the elimination of the natural surroundings.

If, on the other hand, a good photograph of a child amid its natural surroundings be produced without the help of an artistic background, the photographer herein achieves what may be termed perfection of expression. But if an open-air picture devoid of any such background be desired, the pictorial effect of the natural background must be considered in its relation to the child. For this purpose it is not sufficient to test the nature of the ground glass; neither, as in the case of landscape photography, should the effect of the colors be the only point considered in order to avoid the production of vague outlines. The more closely the natural background is brought in contact with the child, the more complicated will the photograph become. A satisfactory method of disassociating the child from its backgrounds is, however, obtained by means of reflection, and by focussing the light strongly on the child, thus obtaining a background of dim and uncertain outlines.

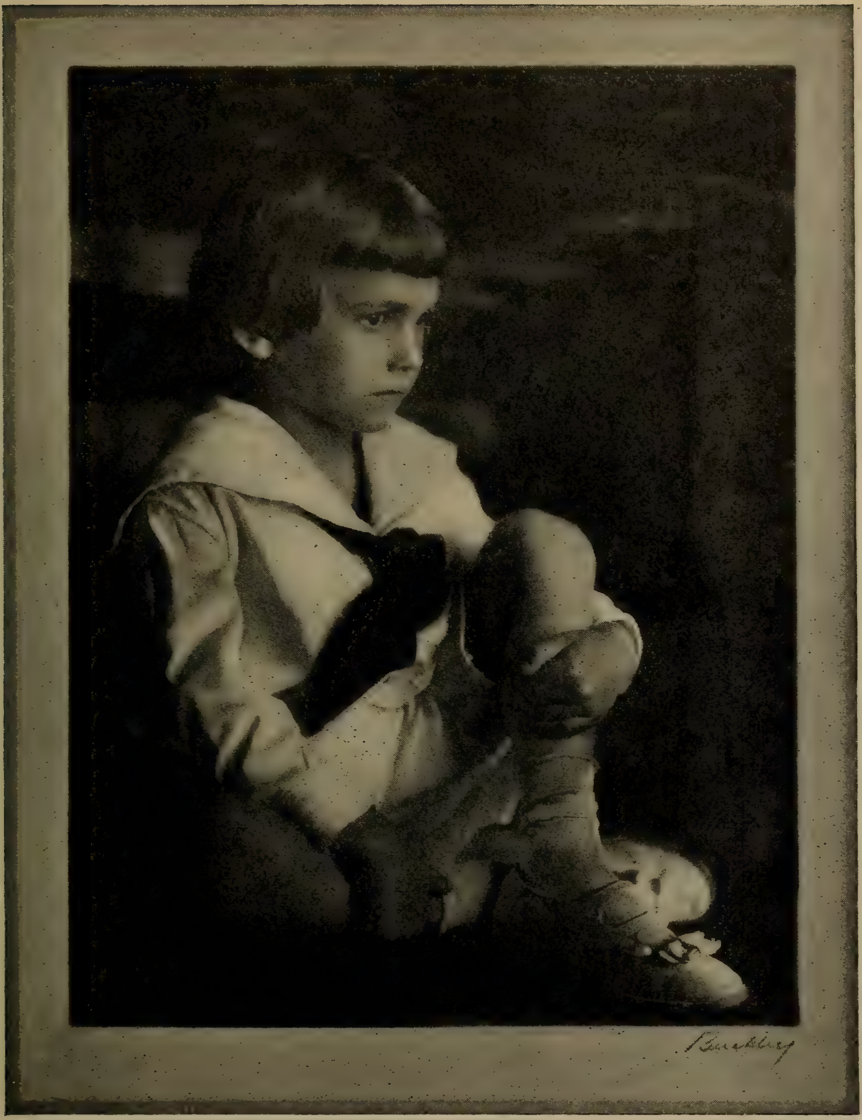
All these rules, of such fundamental importance for studio photography, should be equally closely adhered to in the case of open-air photography, if the object desired be to faithfully portray the essential character of a child in as far as it is possible for the camera to attain this ideal. Moreover, it should be borne in mind that true success in this domain is a product of genius—and for that reason to lay down more specific direction as to methods to be employed were both useless and impossible. The basis of success is individual treatment of the subject and patient study and experiment on the part of the artist. This is the path that the pioneer artists in photography have followed; the path that every artist must follow.

He who would attain success as a photographer of children must possess the power of seeing into a child's mind; he must thoroughly understand and sympathize with him, and be, in short, a true lover of children. The various methods by which a stranger can win a child's confidence are well known. I may say that there are certain definite rules to be observed and adapted to the individual circumstances, all of which are amply elucidated in the special literature devoted to the subject.

A friendly word—a song, or simply muscial sounds, repeated at intervals—these are some of the commonest methods employed. And when the artist perceives the child's face light up with a gleam of satisfaction or express an attitude of intense mental concentration, he knows that the moment of psychological interest has arrived. But all the patience and effort in the world will not suffice of themselves to produce the desired result; the artist must be well trained to read into the mind of a child, and must possess a considerable power of suggestion. Above all he must succeed in gaining the child's confidence. Only when this is attained will he have entirely mastered his subject; and he will succeed in reproducing the life, feeling, character—nay, that fundamental, palpitating element itself which constitutes the inmost individuality of the child.

How manifold are the opportunities of study presented him! The child in its mother's arms, in the cradle, at play in the grass—indeed, at all play which transplants the child into the wonder world. There is a deep meaning underlying children's play; and it would be more correct to say that in reality children do not play at all. So completely do they enter into the subject of their thoughts, be it a doll, a flower, a bird; be it suggested by sound or light or any other agent—that they never fail to preserve the reality of the situation. This fact in child-life it is which should supply the basis for the operations of an observant and discriminating photographer. It will supply him with all that is necessary, provided he sets to work simply; for a good pose is by no means the guarantee of a successful picture. The artist, too, must preserve his own individuality, while yet guarding against rigidity and solemnity of manner, both of which qualities may be useful in the photography of adults but are out of place here. He must beware of the mistake of treating the child as a grown-up person in miniature, and constantly bear in mind the fact that the child lives apart in a world of his own. His thoughts yet dwell in the world of miracle whence he himself came, and the imprint of which he bears in his own personality.

At the present day the want is keenly felt of faithful photographs illustrative of "the child's love of life." There are plenty of detailed representations of various aspects of child-study;



By L. J. BUCKLEY
BINGHAMTON, N. Y.

unfortunately, however, these, especially when found in contemporary journalistic and periodic literature, too often depict the little human animal instead of emphasizing the soft and appealing aspect of the child-nature. In other words, they proceed on the false educational principle of attempting to explain their weaknesses and faults, nay even of defending and glorifying them.

How wide is the range of suggestions furnished by the nursery alone both for the amateur and the professional! Could any parents desire a larger field for intercourse with their children, in which to occupy them, to guide their tastes and develop those traits which are essential for the shaping of character?

Man is bound by an infinite chain to the past of his race and of his own existence; and in this chain the child forms the link that connects the past with the future. He who would rise on wings of faith to free himself from the trammels of the past and to create new forms of life will gain strength to ascend only from his knowledge of what lies behind him. He must ever bear in mind that our idea of reality is foreign to a child, whose own reality on the other hand corresponds to the visions of our imagination; for the child is the greatest mystery of all and embodies all other mysteries.

This work requires no astral or psychological background. For freedom and simplicity alone may recognize true innocence, that strong, creative force in the economy of nature.

PHOTOGRAPHING UPON WOOD FOR ENGRAVING PURPOSES

By ALFRED J. JARMAN

Part II

As soon as the negative has become dry, after intensification, it must be coated with a solution of India rubber, which is made in the following manner from rubber cement, which may be purchased from any wholesale chemist at about two dollars per gallon.

Rubber Coating Formula

Rubber cement	10 fl. oz.
Benzine or benzole . . .	10 fl. oz.

Place these in a wide-mouth bottle with a good fitting cork; shake the mixture well, when it will be ready for use in about one hour.

Pour some of this mixture, which has now become thinned to the required consistency, into a wide-mouth, six- or eight-ounce bottle. This size bottle is well adapted for handling. Now hold the negative by one of the top corners; pour a small pool of the rubber mixture in the center; then, by tilting the plate, allow the liquid to run first to the free top corner, then down the off side, finishing, and draining the excess into the bottle it was poured from. Allow the excess to drain well into the bottle, by rocking the plate on edge, to and fro, so as to effect complete draining, then place it in a rack to become set.

As soon as the surface has become set, which may be greatly aided by an electric fan, it must be coated again with what is known as "leather" collodion or stripping collodion. (Under no condition must the setting or drying of the rubber coating be hastened by heat. Should the negative so coated be considerably heated, the rubber will melt and penetrate the collodion surface, thus fixing it to the glass plate so effectually that it cannot be stripped.)

Stripping collodion may be purchased

already made, or it may be made according to the following formula:

FORMULA FOR STRIPPING COLLODION

Wood alcohol (absolute)	10 fl. oz.
Sulphuric ether	10 fl. oz.
Pyroxyline (photographic cotton)	140 gr.
Castor oil	2 dr.

The mixture must be well shaken until the cotton has become dissolved, when it may be stood aside for a day or two to permit any insoluble matter to settle, and then poured into another vessel ready for use.

An ordinary wide-mouth, six-ounce bottle fitted with a good cork, as in the case of the rubber solution, is well adapted; or, if possible, use an ordinary collodion bottle as previously described.

As soon as a coating of stripping collodion has been applied upon the rubber coating and drained, the plate may be placed in a rack to dry, or it may be touched at the lower corner with a lighted match. The collodion film will at once take fire. Then hold the plate diagonally and blow the flame gently off the plate, when it will be found that the ether and alcohol have become rapidly consumed. The plate is now ready to strip. In this condition the negative may be kept for any length of time, previous to stripping.

The wood block or blocks must now be prepared for sensitizing and printing.

Preparation of the Wood Block.

The wood block consists of either a piece of solid boxwood or, more generally today, of a surface of boxwood glued to a backing of maple. Boxwood today ranges in price from $300 to $400 per ton. The best wood is obtained from Turkey. The wood block to receive the photograph may range in price from three cents to eight cents per square inch. It will be seen from this how necessary it will be to produce a perfect photograph upon each wood block.

Preparation of the Salted Albumen

The albumen of half a dozen fresh eggs is placed in a basin with three ounces of distilled water and one dram of strong water ammonia. This is now churned thoroughly with a rotary egg-whisk until the whole is churned into a frothy mass. It must now be allowed to stand undisturbed for twelve hours, when it may then be strained through two thicknesses of cheesecloth that has been wetted and wrung nearly dry. This strained albumen is then placed into a suitable bottle and labelled "Albumen." The salted mixture is made as follows:

Distilled water	½ fl. oz.
Chloride of ammonium	20 gr.
Potassium iodide	5 gr.
Albumen	2 fl. oz.

Dissolve the above salts in the half ounce of water; add the albumen; stir with a glass rod; pour this into a suitable bottle and mark it "Salted Albumen."

There are two ways of preparing the surface of the boxwood block. The first described will give a dead *matt* surface, while the second method will produce a semi-glazed surface, which is the one most generally employed, and preferred by the engraver, owing to the print being much more distinct, while the matt surface print is better suited to receive any leadpencil additional drawing, if required.

Whitening the Boxwood Block

Pour a small quantity of the salted albumen into a jam-pot or glass tumbler; add thereto enough oxide of zinc (zinc white) to form a paint of good covering quality when mixed with a small, flat, bristle brush. Now paint the surface of the wood with this; allow it to stand for a minute or two; then with a piece of clean rag, folded like a ball, carefully and lightly rub the surface in circles all over the block; allow it to stand again for about one minute; then, holding the block firmly with one hand, stroke the surface, first lengthwise, with the ball of the thumb, say, of the right hand; then rub it crosswise very lightly; then diagonally, so that the surface is very even with only a faint-white surface left.

The block must now be dried, and the

surface dipped into the following hardening mixture (or it may be poured upon the surface):

Hardening Mixture

Wood alcohol (absolute) .	10 fl. oz.
Formaldehyde (40 per cent.)	½ fl. oz.

This treatment will harden the albumen completely, when the block may be fan dried, or dried spontaneously, and will be ready to sensitize.

Sensitizing is done in the following way: A special mixture is prepared for the purpose.

Formula for the Sensitizer

Pure nitrate of silver . .	½ av. oz.
Distilled water	1½ fl. oz.
Citric acid (crystal) . .	1 dr.
Glycerin	6 fl. oz.

Dissolve the nitrate of silver and the citric acid together after crushing the crystals of citric acid, then add the glycerin; stir this mixture well, then pour it into a very wide-mouth, short bottle ready for use. Standing in the mouth of this bottle should be a three-inch glass funnel with a plug of absorbent cotton pressed lightly into the neck, so that the excess of solution may be poured into this from the block when it has been sensitized.

Sensitizing the Wood Block

This may be done in two ways. That used by the writer is as follows: A small pool of the sensitizer is poured upon one end of the block and this is guided all over the surface with a glass rod, by touching the outside edge of the block and so spreading the liquid that the surface of the block does not become touched, thus preventing any scraping. The block is then stood upon paper, on a level surface, with the further addition of a small quantity of sensitizer, so as to cover the entire surface, and allowed to remain for four or five minutes. In this time the surface becomes completely sensitized. Meantime the collodion film is stripped in the following manner by cutting the film with the tip of a sharp knife.

The negative being ready the film is cut all round within an eighth of an inch of the picture. It is then placed in a mixture of strong acetic acid and water as follows:

Stripping Solution

Water	16 fl. oz.
Acetic acid	2 fl. oz.

In the course of five or ten minutes the plate may be removed, and a piece of paper (newspaper will answer the purpose), cut a little larger than the picture to be stripped, is wet with the acid solution and placed upon the plate. The corner of the collodion film is now lifted with the tip of a knife pressed upon the paper at the same time, and both lifted together, and the film then resting upon the paper may be laid back down upon the plate from which it had been stripped so as to be ready to place upon the sensitized block.

To produce a semi-glazed surface, the block, after it has been whitened and dried from the alcohol bath, must be coated with a covering of the salted albumen already described, by pouring a small pool of this upon the surface, then guiding it evenly all over by means of a glass rod, in the same way as described for sensitizing, then drained into the bottle it was poured from, reversed in position, and dried again by standing it cornerwise in a rack. The drop of liquid remaining at the lower corner may be wiped off with the tip of the finger. As soon as this albumen coating is quite dry it may be sensitized in the same way as described for the matt surface block.

Printing the Wood Block

As soon as the block has been sensitized, drain from one corner the excess of sensitizer into the funnel. Place the stripped film upon the block with its paper backing; hold these tight at one corner; lift the opposite corner of the paper with the tip of a knife, leaving the film upon the block. Now hold the film to the block at the top center, and carefully stroke the film down on the block with an evenly cut piece of white blotting board, so that the excess of sensitizer drops into a graduate. Carefully stroke the film all over, so as to secure even contact by reversing the hold on the block. Any sensitizing liquid attached to the sides should also be wiped with the blotting strip.

The printing may now be proceeded with.

Printing the Picture Upon the Block

The wood block with the film attached may now be exposed to either daylight, direct sunlight, or the electric arc light. In bright daylight the printing may require any time from five minutes to twenty; in sunlight from half a minute to five minutes; by the electric arc light consuming 12 to 15 amperes on a 110 volt circuit, direct current, any time from eight seconds to thirty.

The progress of the printing is seen by holding the block and film firmly in one hand, when, by lifting one corner partly across the print, the depth of printing is easily seen. The right depth of printing for this class of work is decided when the print is perfect as a finished picture—not too light nor too dark—because there is no loss in the fixing process.

Fixing the Print

As soon as the print has been made the film is lifted and placed in a tray of clean water, the block being placed into the following fixing solution, face down, so as to float upon the surface:

Fixing Solution for Wood

Hyposulphite of soda . .	8 av. oz.
Water (ordinary) . . .	40 fl. oz.
Common salt	2 av. oz.

Allow the printed block to float in this for two minutes—never over three minutes; remove it and wash well under the faucet for about one minute; stand it on one side upon a folded newspaper to absorb the excess of water; wipe the sides and back dry. Then place the surface directly into the alcohol formaldehyde solution, previously described, for a minute; remove, drain and allow to dry spontaneously or by an electric fan. The latter expedient is always used by the writer. As soon as the block is dry it is ready for the engraver.

The use of the strong alcohol and formaldehyde bath after washing, the writer has found to be very beneficial, because it not only hardens the albumen, but extracts the water from the pores of the wood and the glue of the joints and thus produces an even polished surface, without any melted glue lines showing, as has been so often the case, especially when large blocks of wood are used.

In the writer's practice this alcoholic solution is used in a 5 x 7 or 6½ x 8½ enamelled steel tray, and when used it is not allowed to stand exposed to the air, but returned at once to the bottle it was poured from, through an enamelled funnel with a plug of absorbent cotton pressed lightly into the neck, so that the solution is always used in a clean condition, free from specks of foreign matter. This plan of working also preserves the strength of the alcohol, preventing it from absorbing moisture from the atmosphere.

From the description given it might be assumed that the process is a long and tedious one. Such, however, is not the case. Of course, care and skill are required, both of which come by practice. The writer has often produced a printed block complete in thirty minutes, or at the utmost in forty-five minutes.

For small negatives, from which a print is required in a hurry (called "rush work"), a special collodion is used which does not require a coating of rubber solution nor after collodionizing. The formula is here given.

Negative Collodion for Stripping, Without a Rubber Coating

Pure grain alcohol . . .	2 fl. oz.
Negative cotton	40 gr.
Sulphuric ether	2 fl. oz.
Iodide of ammonium . .	10 gr.
Iodide of cadmium . . .	10 gr.
Castor oil	4 drops
Solution of gutta percha in chloroform	6 drops

This mixture must be shaken well several times during the daytime, then allowed to settle, which will require two or three days. The clear portion is then very carefully decanted into a clean, five-ounce, wide-mouth bottle, with a good-fitting cork. It is then ready for use.

This collodion is used upon a $3\frac{1}{4}$ x $4\frac{1}{4}$ plate, previously albuminized and sensitized in the same nitrate of silver bath that is used for the usual work. When sensitized it will present a somewhat opalescent appearance. The time of exposure required will be about 50 per cent. more than for the ordinary collodion. Development is carried out in the same way with the acid iron developer as already described; then fixed, intensified, washed and dried spontaneously or by an electric fan. No heat must be applied, either in drying or stripping, because this would cause the film to stick to the glass plate, thus preventing its removal.

The negative may now be placed in the acid cold stripping bath, after being cut around the picture to the size for printing; then a piece of clean white paper of strong texture wet in the acid solution, placed upon the film, stripped as already described, placed upon the sensitized block and printed.

The collodion film produced by this means must be handled with care because it is much thinner than when coated with rubber. It answers the purpose for small objects, and effects a saving of time in making a print upon a small block for rush work.

All the wiping papers, slopped solutions and any rags used for wiping should be saved—as well as the filtering cotton plugs of the sensitizing baths—and dried, together with all silver bath washings and used hypo solution of wood block fixing, and placed in a stoneware crock with a few pieces of liver of sulphur added and stirred occasionally to cause the silver to be precipitated as sulphide. At times pour off the clear liquor and retain the silver sulphide by filtering through blotting paper and dry. When enough waste has been collected, send it to the refiner.

The sink over which such work as this is conducted should be provided with a raised outlet, like a small wooden box, open at top and bottom, and fixed over the usual draining grid by means of Portland cement being banked around it—(about four inches square inside answers the purpose)—so that the wash-water flows over the top, thus permitting the precipitated silver salts forming a sediment along with the loose collodion skins, all of which may be saved, and ought to be, as silver today is worth over one dollar per ounce. The returns from these savings help to reduce the cost of production. A tinplate cap, punctured with holes, should cover the top of the box retainer to prevent the outlet being choked with collodion skins or other residue. A bag made like a small pillow-case, tacked to a wooden frame (an old 5 x 8 printing frame will answer), suspended in a large stoneware crock, will form an admirable filter for the sink residue.

If a tray is used for the cyanide solution to fix the negatives in, this solution should be saved separately, in either a large stoneware crock or a large wide-mouth bottle. When enough has been collected the silver may be precipitated by the addition of hydrochloric acid, stirred well with a stick, when a goodly precipitate of chloride of silver will be produced, which may be collected by filtration as in the case of sulphide. Care must be taken, however, not to smell or breathe the fumes given off when the acid is added, as this is very poisonous, being, in fact, cyanogen or prussic acid vapor. The vessel containing this should be placed out of doors or under a chimney flue.

When the intensifying solution has become exhausted, or inactive, a fresh precipitate of biniodide of mercury may be made and the inactive solution added. Then a very small quantity of hypo solution is added until the precipitate is dissolved, when it will act as vigorously as ever.

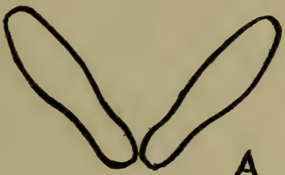
The description given in these articles will enable any person desirous of practicing photography upon wood to attain complete success.

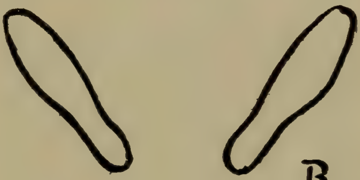
STANDING POSITIONS

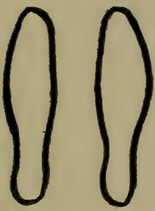
By SIDNEY ALLAN

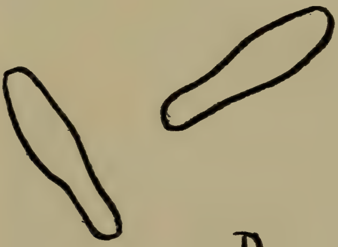
IN full-length standing figures the position of the legs and feet is of the greatest importance. If a man or woman in a standing position does not feel at perfect ease, the whole figure is apt to look awkward.

People under the skylight should be allowed and induced to stand in absolutely natural attitudes, *i. e.*, attitudes natural to them when they are at home and unconscious of posing. True enough, sitters are not apt to fidget about their feet as much as about their hands, but they easily fall into awkward positions, and it remains for the photographer to discriminate whether they are accidental or individual attitudes.


A


B

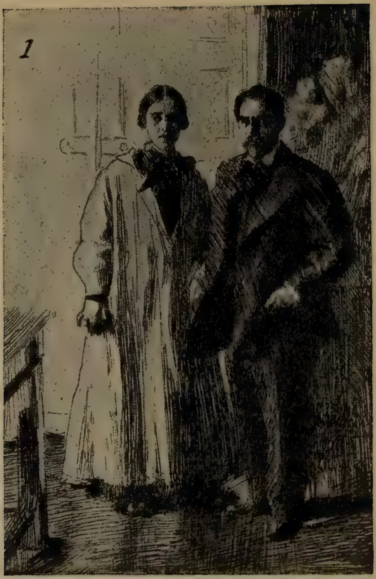

C

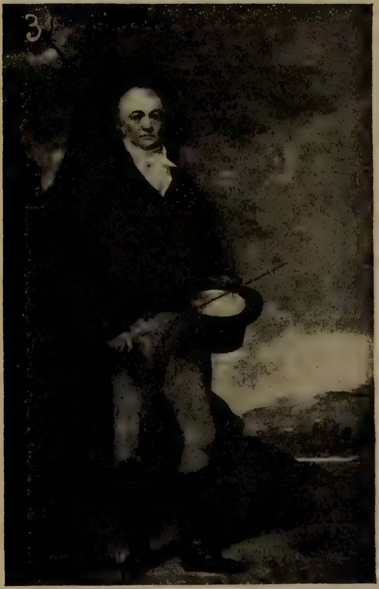

D

Nobody would call the way Mr. and Mrs. Curtis (Fig. 1) are standing graceful, but it looks natural, and one feels that it is characteristic of them. In Fig. 2 we have just the opposite. It is a beautiful picture, and the figure a clever bit of composition, but it looks *posed*, and even a trifle theatrical.

Photography has to answer for many absurd attitudes, as, for instance, the one of Diagram *F*. We are all acquainted with it. It is in ridiculously bad taste, and surely not natural. The pose occurs in statues, but when it does occur a staff or some other support is given. How it should ever have become popular in photographic portraiture is difficult to explain, as a man in modern garb rarely assumes that attitude unless he is leaning on a cane or something.

There are really only very few positions of graceful standing. They might be divided into four: First (Diagram *A*), where the feet form a right angle, the heels touching each other (Fig. 1). It lends firmness to the carriage of the figure. Second (Diagram *B*, Fig. 1), the feet separated, but otherwise the same as in *A*. Of course, one or the other might be advanced or drawn back a trifle; all I want to indicate in this analysis is the principal characteristics of the various positions. Many men are in the habit of standing that way. It demands careful management of the arms to balance the straightness of the legs. Women do not look well that way, excepting young girls dressed for some outdoor sport; for instance, holding a tennis racquet in front of them. The position of the feet in diagram *C* is a distinctly feminine one. Fig. 2 might stand that way. It only suits certain





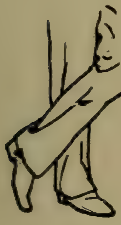
"MR. AND MRS. A. CURTIS"
ETCHING BY ZORN

PORTRAIT
BY RAEBURN.

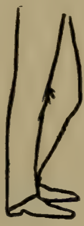
"MADAME DE SOMGIE"
BY EMILE WONTUS

"KEEPER OF THE BULLS"
BY I ZULOAGA

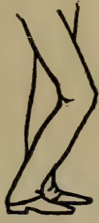
women and certain attitudes. Diagram *D* shows the most normal position. A naturally graceful person always stands in this fashion, and all other persons whenever they are graceful. Watch for that moment when a straight line from the toes to the heel of the advanced foot would cut the center of the other foot at a right angle, and you will always have the sitter in a graceful position. You will notice that the old English gentleman in knee breeches (Fig. 3), as well as the gaunt figure by Zuloaga (Fig. 4), a crude, rough type of a Spaniard, have been placed in this position. You can absolutely rely upon this rule, that whenever the feet are in the right position, the body will follow suit. All good actors are aware of that fact.



E



F



G

Graceful persons generally let the weight of the body be borne by one leg, and advance or draw back the other one. This throws out the hip of the leg which bears the weight and gives a picturesque swing to the whole body.

The most appropriate view of the body in full-length standing figures is the three-quarter one. A standing figure seen entirely in profile does not look well, and I do not recall at the moment a single instance when it has been attempted in portrait painting.

Diagrams *F* and *G* show a man's legs in profile. In *G* there is more chance for a clever arrangement of lines, but I believe that for ordinary purposes the leg nearest to the camera should be the straight one. It obliterates the double curve, and there are so many people who object to bent legs.

A standing figure either stands absolutely free without any support, or is leaning against or supporting its arms upon something. In my opinion the first is to be preferred. A standing figure should simply stand. A leaning position is not particularly graceful. The slant backward, although cleverly managed in this particular portrait, would be detrimental to the lines of most figures, excepting very tall ones. To support the arms on some piece of furniture or other demands extra care in the arrangement of arms and hands and a lot of really unnecessary paraphernalia. In home portraiture it may prove advantageous, but in studio portraiture meaningless poses are to be avoided. Also, the arms should be made as little conspicuous as possible. Let them hang down naturally. It always looks well. Or let them be occupied in holding something. One arm akimbo, or one hand in the pocket or resting in the belt are effective poses.

The simpler a figure stands the better it is for a portrait. The poses should never mean anything in themselves; by this I mean that in looking at a portrait one does not want to ask one's self why the figure is standing in such and such a way. It should merely show us the man or woman in one of their most characteristic attitudes. Of course, at times the suggestion of some arrested motion may enhance the pictorial value of a picture, as when reaching for a door-knob, ready to leave a room. It will not harm the portrait proper, as the suggestion of action is subordinated to the likeness; but neither will it help it, and it would take very little to change a portrait into a story-telling picture.

I consider standing figures seen to the knee more desirable in photographic portraiture than full-length ones. A full-length figure really needs some special environment. It should be seen in a room or out of doors, or the feet will look awkward. They have such a wicked tendency to look larger than they are. A knee portrait in most cases will serve the purpose just as well, and is easily brought into harmony with an ordinary background.

But whatever you do, do not screen off the light entirely from the feet, or darken them into indistinctness by rubbing them down on the negative, or, what would be still worse, vignette them off.

My observations in this article only apply to standing positions of grown-up folk. To the feet of children more latitude of expression is allowed, and I will speak of this anon in a chapter on out of the ordinary attitudes and poses.

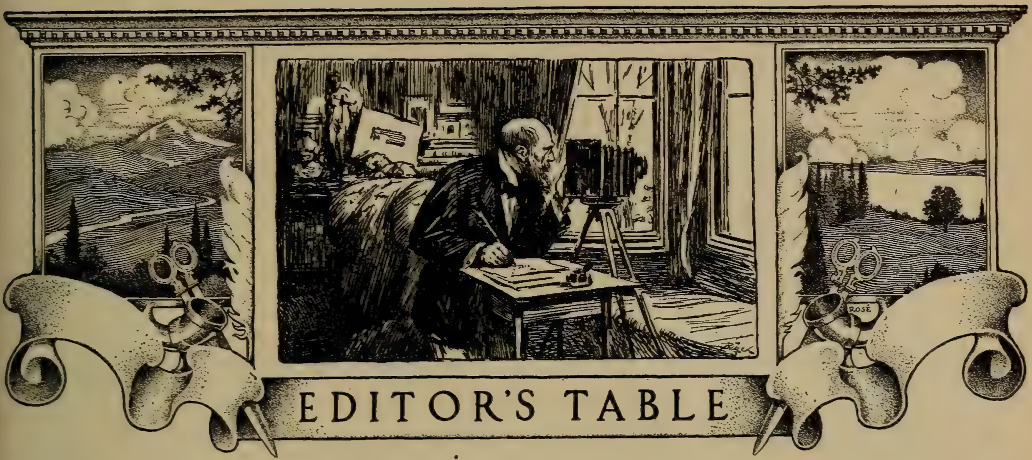
OPTIMISM

IF your business makes you unhappy give it up. If a man cannot be happy in his work, where in the name of Ned can he be happy? For he spends two-thirds of his waking time at his business. The big men of the world have been, and will always be, optimistic. Lincoln, the great humanitarian, had a wonderful sense of optimism and humor, perhaps more than any other public man. That is one reason why he lives in the memory of the American people.

Let the life of Robert Louis Stevenson inspire men to greater optimism. Flat on his back he lay often for weeks at a time, his body racked by pain; yet not one weak or negative word escaped his lips. Instead, his glorious mind shaped this thought: "A happy man or woman is a better thing to find than a five-pound note. Their entrance into a room is as though another candle were lighted."

Optimism, what a wonderful power it is; what a wonderful power it gives! Optimism—the hub of harmony, the life and foundation of business and social progress; the sunshine of life, the steam of the human engine, the electric current that moves to action. Optimism—the key to perpetual youth, the builder of tissue, the feeder of nerves, the creator of health, the spark that ignites the magazine of inspiration in the soul.

How develop Optimism? Be glad about something; be glad about everything; work yourself up into a state of ectasy. Get in tune. Keep in tune. Whistle and sing. And let the melody fill your life with gladness.—*More Pep.*



EDITOR'S TABLE

THE PRIME ESSENTIALS

COMMERCIAL men have been known to remark that the photographer is, as a rule, deficient in the business end of his profession. Artists and scientists, of whatever grade or branch, are too often unfitted by their training and nature to meet the practical issues encountered in everyday business. How rarely do we see the artist blending with his pictorial skill the turn of mind needful to secure the best results from his talents! There is a lack of method in his work which, when put to a commercial test, discloses a want of appreciation of the first principles of business. This statement cannot be denied by the keen observer, and, therefore, must not be taken as a reproach by photographers more than any other class. As a body they must of necessity know something of art and science, if only in a small way, and naturally the omission of the third quality needful for success is not to be surprised at. But business acumen is the keystone of the arch.

The photographer is time and again urged to concentrate more of his time and thought on the art side of his work. Good advice to follow, but would he not be better repaid by a more diligent application to the business end of his profession? He must master thoroughly the questions of lighting, posing, developing, etc., until these become second nature. Lofty ideals do no harm, but the chief end of business is not in the knowing how to do the best work but how to turn good work to the best advantage.

Two illustrations: We all know the photographer who can pose well when he likes and make a good negative, but who is unreliable. His studio has an untidy appearance, his dark-room is even worse. Poor business with a limited and uncertain income is the result. His competitor in the same city is of the other sort; he runs a neatly appointed and well kept studio, his proofs are delivered when promised, his sitters get the impression that they are doing their own posing and can do it more naturally than he can, while all the time he is posing them to the best of his ability. He is content to think that the plate manufacturer knows the best developer for his own brand of plates. He is courteous and observant, and concentrates his attention on the essentials, leaving the higher ideals somewhat severely alone. Good business with its rewards follow.

While the photographer should strive for artistic and scientific skill in his profession he should not forget that management and salesmanship are the first essentials for success in business. If he can, without losing sight of these two points, cultivate his ideals the greater will be his reward. But the fact remains that fair work, well placed before the public, is bound to produce better business results than good work poorly introduced. The prime essentials for business success are business methods and businesslike management.

PRACTICAL PAPERS ON STUDIO WORK AND METHODS

Wedding Groups

As a rule wedding groups do not form a particularly remunerative class of work, and are moreover rather trying jobs, but as a rule they are approached with a certain amount of enthusiasm, not unmixed, on the part of the younger members of the profession, with a little anxiety. One thing that is to the good is that each job serves as an advertisment, as many of the copies come into the hands of those who are likely to want similar groups in a few months or perhaps a year or two. Wedding orders generally want a little looking for, and it is desirable to have a working agreement with those tradespeople who will have early news of the "happy event." Among these are florists, milliners, jobmasters, caterers, and the like. It is a curious thing that the group is often overlooked in the hurry of preparation, so that if the photographer does not approach the bride's friends in good time the opportunity may be lost. It is a good plan to submit three or four specimen groups in a portfolio with a polite note quoting prices.

The next thing to be done is to ascertain where the group can be most conveniently taken. If it can possibly be managed, this should be at the studio, as not only can the difficult contrasts of lighting be more satisfactorily handled, but the members are more easily handled than at home. As a rule the work is done at the bride's home or at the hall where the reception is held, and in this case it is desirable to get the time fixed as early as possible, as after refreshments have been freely partaken of it is sometimes difficult to avoid "moves," while the difficulties of posing and arrangement will be increased. Great tact is often called for when it is necessary to subdue the exuberance of the funny man without giving offence.

One must start with some general idea of arrangement of the figures, the great thing being to balance the light and dark clothing so that a spotty effect is avoided. By this I mean that it is not desirable to place a lady and gentleman alternately, but rather to group the light and dark clothing in masses. A very common scheme which is usually satisfactory is to have the bride and bridegroom seated in the center; in either side of these are the parents or other close friends; behind this line are grouped the bridesmaids, and other figures are grouped at the sides of these two lines and on a third line behind, if necessary, care being taken that important personages are not relegated to the background. If young children are to be included, they may be placed in front, but not so as to hide any portion of the bride's dress. These little ones may stand in the front row between the elder folk, if preferred.

The choice of a background for an outdoor group is often a difficult one. If it be possible to include the house it will usually improve the lighting and give interest to the picture. Foliage backgrounds are not so good, and should be avoided if possible. Above all, no heads should be allowed to stand out against the sky above foliage or fence. A very nice grouping of a more informal character can easily be arranged where steps coming down from a doorway or French window are available. In this case all the figures may be standing, but due care must be taken that the principal figures are in the most commanding position. Overcrowding on the one hand and straggliness on the other must be steered clear of.

It may be suggested, in extremely unfavorable weather, that flash-light may be used, the group being arranged indoors. Hence it is advisable always to be prepared with a flash-lamp and supply of powder. A friend of mine recently saved the situation in this way when a storm prevented outdoor work from being attempted.

As a general rule 12 x 10 is the size adopted for such groups; it should be pointed out that in smaller sizes the individual portraits are not large enough to be of any value. People expect to pay very much less for whole-plate than for 12 x 10, yet, except for cost of materials, the trouble and expense are the same in either case. If the group is to be an outdoor one, extremely rapid plates should not be used, for with a slower plate and fuller exposure more harmonious results can be obtained: 200 to 220 H. and D. is quite rapid enough. It is absolutely essential to the best results to use backed plates, and to ensure this on short notice it is wise to keep a tube or pot of backing always ready for use. There is no need to wait for it to dry if a piece of thin brown paper be placed at the back of the plate to keep the spring of the partition from touching the color. A little methylated spirit may be used to thin the color and will facilitate drying.

More wedding groups are spoiled by over-development than by any other cause, and it is as well to commence development with a solution half normal strength. This should with time give sufficient density in the black coats before the white dresses are overdone. In case there is too much contrast it should be reduced with persulphate in preference to ferricyanide. Persulphate is not difficult to use if all traces of hypo are kept from the plates and a sufficiently strong solution, say 10 per cent., of sulphite of soda used to stop the action.

Printing and mounting are matters for individual tastes. Many photographers still print outdoor groups in P. O. P. and mount them upon plate-sunk mounts. I should prefer a fine platino matt-surface bromide mounted upon a stout cream "art surface" card with bevelled edge, leaving a margin of about one inch. That is more convenient for posting than the old mount with a three or four inch margin.

Portraits of the bride and bridegroom only are usually more remunerative than the ordinary groups, and if possible should be taken in the studio. Often the arrangements for the journey prevent this, so that the pictures have to be made "at home," and it is hardly necessary to say that in most cases an indoor portrait will be preferred to an outdoor one. Most decent-class houses have a room with sufficiently large windows for this to be done.

The opportunity of suggesting miniatures in bridal dress should not be lost, as it is usually much easier to obtain orders at a time when the customers are pleased with themselves and everybody else than it will be later on when the bills begin to come in.—*B. J.*

Portable Studios

THE term "portable" has a wide range of meaning when applied to a photographic studio. It may mean a caravan on wheels, a wooden building which can easily be taken to pieces and erected elsewhere, a specially designed tent, or even a temporary shelter for the sitter and background, the camera and operator being in the open.

Studios in the first category—that is to say, of the caravan type—are now not so common as they used to be in the early collodion days, when many villages, and even small towns, had no photographer domiciled in them. There are, I believe, some which travel along with roundabouts, wild beasts, and fat ladies from fair to fair throughout the country, but I have not seen one for a good many years. Some of them were quite elaborate affairs, fitted up not only for glass positive and ferrotype work, but for printing on albumenized paper, the work often comparing favorably with that issued by many fixed studios. It may puzzle those who have never seen one to imagine how sufficient space was obtained, but this was easily done by adopting a telescopic form of construction, an inner body sliding out and being supported upon trestles.

The form which will probably be of most interest to the majority of my readers is not a studio that is here today and gone tomorrow, but one which is intended to remain in one place for months, if not for years, but which can, if needed, be removed and re-erected at small cost, and by unskilled labor. Such studios are usually made entirely of wood and glass, and their portability is due to the fact that there is no general framework, but that the whole is built up in panels, which are fastened together with ordinary iron bolts and nuts. I will endeavor to give some idea of their construction, which is quite simple and well within the powers of the village carpenter, or even of an amateur who has some idea of woodworking. The first thing to be decided upon is the size, and, this being done, a drawing should be made and the size of the panels settled. It is necessary to be very careful in constructing these that they should be exactly the size that they are supposed to be, or there will be a lot of unnecessary work when it comes to fitting together. The design is usually the ridge-roof one, somewhat after the pattern of Noah's ark without the barge. For a studio 20 x 12 x 8 ft. (to the eaves) and 11 ft. to the ridge the following divisions will be convenient: Each end is in two sections 6 ft. wide, one side being 8 ft. long and the other 11 ft. long. The two pairs of panels are exactly alike, except that one will probably have the door frame fitted into it. It must not be forgotten to keep the frames on the proper sides when nailing on the boarding, or they will have to be remade. I mention this because I have known three right-hand sections and one left-hand made, instead of two of each. The sides are made in four sections, each 5 ft. wide and 8 ft. high. Six of these are entirely covered with wood, and two have a cross-bar, say, 4 ft. up. Below this, wood is nailed on; above are sash-bars for the sidelight. The roof calls also for six wooden panels and two which are frames only, fitted with sash-bars for the top light. These are all 5 ft. wide and about 7 ft. long, so as to give a slight overhang at the eaves. The edges which meet at the ridge should be bevelled so as to give a good bearing. For a studio of this size the frames of the panels should be made of 4 x 3 deal, and the boarding should be good yellow $\frac{7}{8}$ matching. The frames may be mortised if the extra labor is not objected to, but "halved" joints answer quite well, as the boarding has to do its part in keeping the panels square; good cut nails should be used for fastening. The side and end panels should each have a crossbar halfway up, as not only does this stiffen the construction, but it keeps the boarding from warping. In all the panels the framing comes inside the studio, and the panels are fastened together by drilling holes in which the bolts fit well, and without shake in the frames, so that, when laid side by side, they are drawn closely together. In the end sections the bolts run through the boarding as well as the frame, and are tightened up in the same way as the side joints. It is perhaps hardly necessary to say that the woodwork should all be erected before the glass is put in the sashes, and that, in case of removal, the glass should be taken out before anything else is done.

Having made all our panels, we can assemble them. First the two ends are put together, and then the sides joined up to their full length. The back should next be joined to the ends, then the front fixed in, and finally the roof sections put up in pairs and screwed through on to the tops of the frames. Although not always done, it is a good plan to put one or more iron tie rods across at the level of the eaves to prevent any outward thrust. These should be ¾ in. to 1 in. in diameter, threaded at the ends with a good large nut put on both sides of the top of the side frames through which the rod goes.

The flooring is made in panels the width of the studio, and drops upon the lower part of the frame. There should be some arrangement of joists or brick piers to prevent vibration and sagging.

The roof will require a waterproof covering. This may be corrugated iron or the asphalt roofing material known as Ruberoid, or, if obtainable, Uralite, which is fireproof, may be used. This is a sort of asbestos and plaster composition, and would keep the studio cooler than iron. It has the merits of not rusting and requiring no paint.

A building erected in the above way will not keep in condition long if placed directly upon the ground; therefore, some foundation which will keep the lower part dry must be provided. For a reason to be presently given this should be of a temporary character, and one which we found very successful was a row of loose bricks all round, the exact size of the studio, with two rows at equal distances running from end to end inside. Upon these bricks rested four long deals 20 ft. long and 3 x 9 section; the sides of the studio stood upon this, and there was sufficient space between the bricks for air to circulate freely below. A studio so erected was taken down after nine years, and was found to be quite sound, as were also the long timbers.

If one is building upon another person's land it is necessary to be very careful to do nothing that will give the landlord a claim to the building. If a studio or greenhouse is erected upon a brick foundation which forms an integral part of it, the whole at once comes under the control of the landlord, and the tenant cannot legally remove it. It has been held in the case of a lean-to greenhouse that the driving of iron holdfasts into the wall of a dwelling-house to secure part of the framework removed the structure from the category of "tenant's fixtures," and made it a part of the freehold.

The foregoing description is necessarily of a sketchy nature, but I shall be pleased to fill in any details in the "Answers to Correspondents" column in case of need.

Tent studios are not much in favor in this country, as there is no possibility of using glass as part of the covering, and there is no waterproof material which will retain its whiteness for any appreciable period. Celluloid is, of course, out of the question, on account of its cost and inflammability. The most elaborate tent studio I have seen was one sold by the Stereoscopic Company a quarter of a century ago. It consisted of a wooden skeleton of the ordinary ridge-roof form. The parts usually solid in a permanent studio were covered with tightly stretched sail canvas; the top and side lights were without any permanent covering, and were fitted with dark and light roller blinds of the usual type. This was necessarily a rather costly affair, and a much simpler arrangement could be constructed with an ordinary small marquee as a basis. If an opening were cut in a suitable position and a light wooden frame, or frames, fitted with wires and festoon blinds put in, quite a useful studio could be made. Some years ago a woven wire roofing, the meshes being filled with a transparent varnish, was placed upon the market; it was tried for studio lighting, but, being rather yellow, caused the exposures to be too long. Now that plates are three times as fast it might be worth trying it again, if it is still made. I have often thought that a serviceable studio might be made upon what is known as the tunnel principle—that is to say, a comparatively short square compartment for the sitter and background and a small tunnel or passage without light for the camera and operator. This idea could be worked out in the form of a tent, and would have the great advantage of being economical of material and presenting the minimum area to wind pressure. It would not be difficult to arrange such a studio so that an ordinary shower need not interrupt work.

So-called "lawn" studios are merely devices for holding a background and curtains for cutting off the worst of the top and side light. Houghton's used to list a very neat arrangement of this type. It is, however, very easy to improvise something of the sort with four tent-poles and cords, a background, and some lengths of light and dark materials for curtains. All that has to be done is to fix the four poles at the corners of an 8 ft., or smaller, square, to run a cord round the tops, steady the whole with the ordinary ropes and pegs, and hang the background on whichever side suits the light. The lengths of material are hung over the top cord to serve as studio curtains. One friend of mine had four clothes post sockets fixed in his garden at the proper distances for a studio of this sort, and could drop the posts in, rig up the curtains, and get to work in less than ten minutes.—*B. J.*

Consider the Cost

When the plumber comes to the studio to do a little repairing he charges a good price per hour for the time he is at work and also for any trips he may have to make to his shop for tools or material.

When the photographer leaves the studio to do a piece of photographic work he has usually quoted a certain price for the work regardless of the time it will take him to complete it. As a rule he makes no distinction between work done a block away from the studio, which will require thirty minutes' time, and work in a factory at the outskirts of town that may require three or four hours of his time.

Labor is the big item in cost of production and time is money when money must be paid for a workman's time. But if you have a one-man establishment you may overlook this fact though it applies to your time the same as it would to a man you might employ.

A photographer had this called to his attention recently and on figuring his time on a certain job at exactly the same rate per hour he would have to pay a fairly good assistant who knew anything at all about photography, found that it amounted to 20 per cent. more than the total amount he had charged his customer for the work. Obviously he had not only sustained a loss of 20 per cent. on his time, but in addition, had lost the value of the material he had used.

Disillusion yourself as to what your costs for doing a job of work really are and you will see more clearly what is necessary to make a real profit.—*Photo Digest.*

Elementary Retouching

ALTHOUGH it is difficult to give any useful instruction in retouching without personal demonstration, I hope to be able to outline what may be termed the mechanical side, leaving the student to acquire, by the study of good examples of portrait work, painted as well as photographed, that artistic knowledge which will enable him to apply his technical skill to the best effect. I would, however, caution the beginner against attaching too much importance to the "before" and "after" retouching examples which are reproduced in most books on retouching, as not only does the half-tone process destroy the character of the original work, but, as a rule, in order to demonstrate his powers, the artist usually puts on a great deal more work than is desirable in ordinary practice. Negatives are sometimes so perfect that no retouching is necessary, and the nearer a retouched negative can approach this ideal the better.

The appliances necessary for retouching are simple and inexpensive: a retouching desk, a bottle of medium, two or three pencils, a glass paper-block, some spotting color and one or two fine sable brushes, and a retouching knife.

Next to the pencils, the desk is the most important item in the outfit, and if the beginner cannot afford to buy a fairly large and substantial desk, he will do well to make a rough one by taking a shallow box about 18 ins. square, such as is often used for packing large negatives in, cutting a hole 3 ins. square in the lid and hinging it to the body. Struts must be fitted so that the negative stands at an angle of about 60 degrees, and a black cloth hood, supported by a wire or cane frame attached so as to exclude all light except that passing through the negative. I specially caution the novice against using the small desks a foot or less in width, which are listed by most dealers.

A reflector of white card or opal should be so placed that when looking through the opening in the desk it is evenly and well illuminated. When dealing with very dense negatives, a piece of looking-glass may be used as a reflector, but care must be taken to place it at such an angle that only clear sky is seen through the negative. If window sashes or other obstructions intervene, they are likely to cause uneven work. When working at night or in foggy weather, a lamp must be used, but a piece of ground-glass must be placed between the frame and the negative, so that the flame cannot be seen. When electric light is available, it will, of course, be used, but in this, as well as with an oil lamp, a piece of thin bluish paper should be placed under the negative to "cool" the light. An engraver's globe filled with water, tinted blue with nitrate of copper, gives an ideal illumination. Incandescent gas requires no blue screen.

The pencils should be fitted in ever-pointed holders, and three grades are usually employed. Before the war the best leads came from Vienna, and the numbers most in use were 2 (rather soft), 3 (medium), and 4 (hard). The English leads which have taken their place are sometimes marked with the ordinary grades, B., H.B., and H., which correspond approximately with 2, 3 and 4; but sometimes they are not marked at all, so that a trial is necessary to ascertain what you have got hold of. The pencils should be brought to a very fine tapering point, using first the glass-paper block and finishing on a piece of hard drawing paper or even brown paper. While working, a touch on this paper to free the point from medium may be occasionally required. The No. 3 or H.B. grade is the best for a beginner, although an expert retoucher can work more quickly with a softer pencil. Retouching medium is a varnish-like compound, and is needed to give a "grip" to the surface of the gelatin, which is usually too smooth to take pencil. There are several good varieties, the best known being American Lead Pencil, Winsor and Newton's, all of which I can recommend from experience.

When removing negatives from the washing water, they should always be wiped or swabbed with a pad of cotton-wool or a wash-leather, so as to remove any lime or other sediment adhering to the surface. If this be not done, the medium will make the negative more transparent where it is applied, and this will show in printing. Intensified negatives should be covered all over with medium for the same reason; in fact, it is a good practice to coat the entire surface, as it is a very fair protection from the atmosphere. It often happens, when a re-order is wanted from a rather old negative, that it will be found to have faded everywhere except where the medium has been applied.

The medium may be applied by moistening the cork of the bottle by inverting it and then touching the cork with the tip of the finger, which is gently rubbed on the parts to be retouched, but a better plan is to use an old silk or linen handkerchief, a small piece of which is damped with the medium and rubbed on the film, the edges being softened off to avoid a mark in printing. Very little medium is necessary, but it must not be polished off too well. In case it is necessary to remove the medium, and, of course, any retouching upon it, this may be done with a soft rag and spirit of turpentine.

Half an hour or more after applying the

medium the negative will be ready for working upon, and the first step is to stop out with the sable brush and a little Indian ink and carmine any clear pinholes or circular marks caused by bubbles in the development. Small holes may be filled with a single touch, but larger ones must be finely stippled. It is sometimes recommended to use "opaque" for this work, but I have found it too opaque for use on half-tones. The color must be applied as nearly dry as it will leave the brush, or it will run on the surface. A very little gum may be added to give a better consistence to the color if any difficulty is found in this way.

Freckles and all similar defects must be treated with the pencil only, and here we begin to understand that what retouchers call a "touch" is necessary. For freckles, small curved marks sometimes compared to a comma without the dot are often used, but a sort of tangled line made by keeping the pencil on the surface and moving it in small circular touches is sometimes better. Do not attempt to stipple-in dots with a pencil, as this takes an enormous time and is not as effective as lines. Do not overdo the touching of freckles: it is better to leave a ghost of them than to substitute a white freckle for the dark one.

Wrinkles are, as a rule, best treated by short, soft, interlacing lines following the direction of the wrinkle itself. Never work across a wrinkle or other line in the face. Where shadows have to be lightened, the circular or comma touch may be used; but it must not be allowed to degenerate into the kind of fish-scale texture frequently seen in beginners' work. An expert retoucher will often appear to be scribbling aimlessly on the negative, but in reality he is varying his touch to suit the texture of different parts of his subject, and this object must always be kept in view by the beginner.

Due consideration must be given to the age of the sitter. Children's faces may be smoothed to any extent; young people's almost the same; but as age approaches we must endeavor to preserve the character and to soften the lines and skin texture without destroying them. With elderly ladies we may perhaps rejuvenate them a little, but not at the expense of likeness.

A common failing with beginners is "spotty" working; that is to say, the face shows a number of worked-up areas with spaces between. To avoid this, the retoucher must not dodge about the negative, doing first one feature and then another, but work right down the face from top to bottom, not necessarily pencilling it all over, but doing what is needed as one goes on.

In present-day retouching the knife or scraper plays an important part, as by its use not only lights but shadows can be put into a negative. Awkward outlines of face, neck, and arms may be corrected, large ears reduced, noses straightened, and many other modifications effected which could formerly be done only upon the print. Space does not allow me to deal with this phase of retouching, and for its study I would refer the reader to the new edition of Johnson's *Art of Retouching* which is the most complete work on the technic of the art which has been published.—*B. J.*

Suiting the Style to the Subject

Is the high-keyed style of portraiture the best for the class of work you are doing? The white background has had a long run, but is there not a danger of running it to its death? It is a charming style for some subjects, but is it wise to use it for every picture you make?

At the present time you are making a large number of portraits of men in naval and military uniform. Are you convinced that the high-keyed style enables you to turn out the best pictures of these sitters?

Light sketchy pictures were popular before the war, and, no doubt, they were very pleasing and admirably adapted for most of the portraits you were then making. The style that suits one class of subject may not suit another.

The high-keyed picture with its white background is seen at its best when used for portraits of children. It falls in so beautifully with the idea of childhood. There are no gloomy, morose shadows in the background; everything is cheerful, bright and dainty—exactly what one associates with childhood.

The same style can very well be used for portraits of smartly dressed women. Here, again, the idea of daintiness and brightness does not seem incongruous. It is quite in keeping with feminine nature—style and subject harmonize, and the artistic effect is heightened by the combination.

When this style is used for portraits of men, however, the result is not so pleasing. Men's portraits need the suggestion of strength and courage rather than of neatness and brightness. The pictures should convey the idea of manliness. When men's portraits are made in the high-keyed style, there is always the danger of suggesting that the sitters are effeminate. The danger is increased when the men are in naval or military uniform, because the trimmings and decorations themselves help to suggest feminine neatness and love of finery.

It is not suggested that the white background should never be used except for portraits of women and children. Art is too subtle to be governed by a set of cut-and-dried rules. There are photographers so gifted with that unconscious feeling of what is true and harmonious, that, in whatever style they choose to work, they will produce pleasing pictures. It is suggested, however, that, in the majority of cases, photographers will succeed in giving stronger and more manly representations of naval and military sitters, by making solid pictures with a reasonable amount of shadow or half-tone in the backgrounds.

The progressive photographer, who aims at really artistic work, will not tie himself to one style; he will not be bound down by convention. He will not give all his sitters the same treatment; he will change his methods to suit the various types of subjects with which he has to deal. Even then, there will be a certain amount of sameness in all the pictures he makes—but it will only be the sameness arising from the fact that every picture will be stamped by the personality of the artist.—*Professional Photographer.*

Spacing

When a cabinet portrait is taken on a half-plate negative, the printer has to be very careful how he lays his cabinet pieces of paper on the negative. Carelessness will result in bad spacing, and, when the pieces of paper are very little larger than the sizes required for mounting, there is no chance to remedy the spacing in the trimming.

The same care is needed in trimming down prints which are printed on larger sheets than are wanted for finishing.

Care and good taste must be exercised, otherwise the good effect of a successful composition may be destroyed. The most common mistake is to leave too much space at the top, too much head-room as it is called. This makes the figure look as if it were falling out of the picture—a most uneasy effect; the figure is dwarfed, squatty and insignificant looking. The raising of the head give height, stability and dignity.

Another mistake is not leaving enough space in front of a profile: too much space behind the head and not enough between the profile and the edge of the paper. This produces a crowded effect and the figure appears to be leaving the picture instead of coming into it.

Of course, the pose and general composition of the picture must be considered when deciding the proportions of space around the figure, but, as a rule, the following suggestions will be found helpful:

When printing a bust portrait, place the head well up on the paper. The same rule will apply when printing a three-quarter figure.

When printing a full-length portrait the space above the head should be slightly larger than the space below the feet.

When printing a full-face portrait, either bust, three-quarter or full-length, it is, as a rule, safe to leave equal margins at the sides of the figure.

When the head is slightly turned, the margins at the sides may usually be equal.

When printing from a profile or three-quarter face portrait more space should be in front of the face than behind it.

These are general rules; they must be applied with care and thought. No set of rules will take the place of good taste and judgment. The suggestions here given, however, will be helpful to the young printer or mounter whose taste is not yet sufficiently developed to be a safe guide. It is a good plan to try experiments with the waste prints which are to be found in every workroom.—*Professional Photographer.*

VIEWS AND REVIEWS

"Animated Cartoons—How They Are Made, Their Origin and Development"

By E. G. Lutz. Elaborately illustrated with drawings and diagrams. Price $3.00 net. Charles Scribner's Sons, New York.

For the professional artist animated cartoons have opened up a new field of endeavor, while to the general public the little animated figures and dancing letters are one of the most interesting and mysterious features of any motion-picture performance. This book has been written for both artist and public.

It reviews the development of motion pictures from the toy stage of the old thaumatrope and the beginnings of animated cartoons. It explains, for instance, how simply the letters in a trick title can be made to dance about the screen and finally fall into proper place in the announcement; also the processes, apparatus, photography, and other technical matters—how movement in the drawing of the human figure is obtained—notes on animal locomotion—dissolving scenes—title balloons—how, by ingenious contrivances, the actual number of drawings required to produce a given effect of motion is lessened—the importance of the animated diagram for educational purposes, etc., etc. A book of value and interest to every motion-picture photographer.

"You Cannot Bluff the Camera"

Is the title of an interesting article in *The American Magazine* for March, by Mr. Gotthelf Pach, who is one of the most famous photographers in the country. He is the youngest and the last to survive of the three brothers who, right after the Civil War, started the New York firm of photographers now known as Pach Brothers. The business is now managed by Alfred Pach, son of Gotthelf Pach.

Among other observations Mr. Pach points out this difference between men and women:

"A woman's ideal of a photograph is different from a man's. Her ideal is beauty; a man's is individuality. If a woman's hand or foot is a trifle too large for symmetry it must be placed in the background or shaded so that the figure as a whole will express grace. The result is that more care has to be taken in a woman's picture than in a man's, and more retouching has to be done later.

"'Don't smooth out those wrinkles,' a man will say of his own picture. 'It took me fifty years to get them.'

"I cannot imagine a woman's saying such a thing; I cannot imagine a woman's being proud of the scars time has left.

"Which attitude indicates the greater vanity? Well, a man as a rule wants to be taken as he is; we may be justified in inferring, therefore, that he is pretty well satisfied with himself. A woman, on the other hand, wants her picture to conform to some ideal, and we may infer, therefore, that she is not satisfied with herself as she is. As to which of these attitudes indicates the greater vanity, I leave it to you to decide."

Art at the New York Camera Club

An exhibition of artistic photography which was unusually well attended and greatly admired, because of its high quality and excellence, was held at The Camera Club of New York City during the months of January and February. It comprised the work of Mr. Floyd Vail, F.R.P.S.

Mr. Vail's interpretations of nature are always effective. He infuses his pictures with personal feeling, sentiment or mood. His touches of sunlight or mystery are beautiful and convincing; his treatment broad, full of atmosphere and, at times, tender and poetic. Harmony of tones, rather than of contrasts, are distinguishing characteristics of his work. His skies are appropriate and varied; his planes truthfully differentiated. Some fine snow scenes, also street scenes and figure studies, were included in his exhibit.

"Indian Summer" is a very remarkable production, depicting mist and sunshine; the valley obscured by haze, yet penetrable, while the sunlight plays in flecks across the foreground and the bordering woods, with overhanging vapor. A picturesque tree dominates the composition, bringing everything into harmony; and a most pleasing pattern is formed by the several spaces of varied tones.

"An Autumn Afternoon" shows a very pleasing design; depicts a brooding, dreamy light; the sky is simple yet appealing and the work remarkable for tonal harmony.

"Art and Nature" presents a well-balanced landscape, with a prominent artist at work interpreting the scene. A charming impression of noonday light is conveyed, and the atmosphere is powerfully brought out.

Some of Mr. Vail's pictures that appeared in the August number, 1919, of the Journal were included in his exhibit and some of the other examples that were full of art quality were: "Midsummer in New England," "Friendly Greetings," "Glendale," "Passing Shadows," "Shadow Brook," "Mohawk Trail," "Peace Dale," "Golden Autumn," "Autumn in New England," besides a number of Mr. Vail's exhibition pictures that have been shown here and abroad.

Wollensak Optical Company Honored

The Wollensak Optical Company, of Rochester, N. Y., has become a member by invitation of the Rice Leaders of the World Association—a coöperative organization composed of manufacturers who possess unquestioned reputations for integrity, dependability, and fair dealing. The emblem of the Association embodies by word and symbol the four qualifications for membership—Honor: a recognized reputation for fair and honorable business dealings; Quality: an honest product of quality truthfully represented; Strength: a responsible and substantial financial standing; Service: a recognized reputation for conducting business in a prompt and efficient manner.

It is worth noting that the Wollensak Company has grown from a factory space of 3500 square feet in 1902 to 80,000 in 1919, and from 32 employees to 610.

The Wellcome Diary

The American edition of *The Wellcome Photographic Exposure Record and Diary* for 1920 has just arrived, clothed, like a cardinal, in red, and as capable and willing to minister to the photographic needs of the photographer as a cardinal is to those of his soul.

It embraces all the excellent features of last year; and, if there are no new ones, it is probably because it is so complete that it is difficult or impossible to make it more so.

We advise all photographers to procure a copy as a book of ready reference on many important subjects, and wherein may be recorded and retained facts in experience and practice too valuable to be lost or mislaid and often necessary to consult.

For sale at all dealers in photographic supplies.

Haloid Co. Branch Offices

The Haloid Company announces the opening of a branch office in Chicago, at 68 W. Washington Street, under the management of O. C. Busch. Mr. Busch brings to the Haloid sales organization a wide acquaintance among Chicago photographic interests. A full line of Haloid Quality Papers and Haloid Guaranteed Chemicals will be carried at the branch, from which Chicago and the Middle Western trade can be promptly and effectively served. The Haloid Company also maintains a distributing branch at 225 Fifth Avenue, New York City. Its factory and main offices are located at Rochester, New York.

Analysis of Photographs of Fog Signals Obtained with the Phonodeik

The source of the signals was a Northey diaphone at Father Point Station, Quebec. Photographs were made by the phonodeik, one of Professor Miller's own devices. A horn directs the sound waves upon a sensitive diaphragm whose vibrations are transmitted to a small mirror. A beam of light is reflected from this and falls on a moving photographic film. As the mirror vibrates the reflected beam moves correspondingly and a sinuous trace of the sound wave is produced on the film.

Records were taken at different distances over water in front of the fog-signal and also on the land away from the axis. By means of the apparatus the curves were analyzed into twenty or even thirty components and the results of the analysis were proved by synthesis. The effective frequency of the fog-signal was 174 per second, though a note an octave below was always present. The analysis gives the amplitude of this lowest component and of 19 harmonics. When these were combined they reproduced the curve actually photographed by the phonodeik.

The relation between the amplitudes of the several overtones varies greatly, changing with distance from the source. The higher harmonics are always feebler than the lower group and disappear entirely at about two miles from the signal. A study of the intensities of the harmonics shows that the master-tone, 174 in frequency, carries best of all to distances of two miles or more, though the octave above it exceeds it at 1100 feet nearer the source. The inverse square law of decrease of intensity was found to be invalid.

When a horn was used on the fog-signal and photographs taken away from the axis, the higher harmonics were not relatively so strong as they were along the axis. An increase in the air pressure used in blowing the diaphone resulted in an increased acoustical output. Elevating the air pressure caused those tones which had the greatest carrying power to increase in intensity more rapidly than the others.—*Trans. Royal Society of Canada.*

Wentworth Pictures

On March 1 an exhibition of artistic camera work by Mr. Bertrand H. Wentworth, of Gardiner, Maine, opened at The Camera Club, New York City. This is the fourth appearance of his pictures at that club.

The exhibit embraced marines and landscapes; and few American pictorial photographers can equal, and none surpass, Mr. Wentworth in this field of photographic art. Many of his pictures are remarkable, some wonderful. Particularly does he excel in rendering mist, fog, spray, rocky shores, sunshine effects in woods and glades. There is a high and unvarying quality to his technic and some of his passages Winslow Homer might have envied.

"L'Allegro" depicts a sun-flecked sea and beach that is very unusual and charming. "The Old Ox Trail" renders brilliant light streaming through trees and distance and throwing the foreground into a blaze of glory. "Surf Shadows" awakens awe and a feeling of Ocean's majesty. "Golden Rod" is, probably, the most appealing of all his work. "Dancing Spirits" and "A Sea Turn" are powerful in atmosphere: "Snow," is a London Salon picture, and is a toneful rendering, rich in beauty of line and seasonal expression. "The Seventh Wave," "Mists of an Out Wind," "Easterly Weather," "Monhagan Spruces," "The Coming of a Fair Wind," "Our Rocky Coast," "Out of the No'th East," and several others are of such poetic beauty and artistic excellence that one could live with them and enjoy them daily.

If any doubt exists that photography is capable, in skilled hands, of producing the highest pictorial results, a visit to Mr. Wentworth's display ought to convince the most skeptical.

AMONG THE SOCIETIES

Report of the New York Convention

Minutes of the 16th Annual Convention of the Professional Photographers' Society of New York, held at the Hotel McAlpin, New York City, February 3, 4 and 5, 1920.

First session opened at 11 A.M. with President Al Downs Rice, of Jamestown, N. Y., presiding. Mr. E. B. Core gave the address of welcome.

Moved and carried, that the reading of the minutes of last convention be dispensed with. Pop Core, chairman of Committee on Entertainment, gave out particulars concerning the banquet.

The following committees were then appointed:

Resolutions—Pirie MacDonald, J. Chester Bushlong, H. A. Strohmeyer.

Place of Next Convention—B. J. Holcolm, Jacob Schloss, F. T. Loomis.

Nominations—J. E. Mock, Dudley Hoyt, Carl K. Frey.

President Rice made the announcement that Mr. Robert E. Ramsay, who was to give a talk at this time, was ill, and could not be present.

Afternoon session called at 2.15 P.M. "Pop" Core introduced Mr. Lejaren Hiller, who explained at some length his interesting work, which is "Magazine Illustrations and Pictures for High-class Advertisements." His products are principally photographic, but his advanced knowledge of art enables him to supply lacking features with the brush, thereby making his compositions perfect. He had many samples of his work and explained how each was made. The talk was in every way pleasing and instructive.

Letter from Mr. J. B. Schriever, of Scranton, Pa., President of Middle Atlantic States, expressing regret at his inability to be present, was read by the Secretary; also telegram from Past-President Howard Beach, of Buffalo, wishing for the members a successful convention.

Mr. MacDonald then introduced Mr. Ira L. Hill, who gave a demonstration on posing and lighting, using two Broadway girls as his subjects. With ease and simplicity Mr. Hill produced many pleasing postures and lighting effects.

Wednesday morning session called by President Rice at 10.45 A.M., who at once introduced Miss Jessie MacDonald. Miss MacDonald gave a talk on "Business Correspondence." She particularly emphasized the following points: Get personality in your letters. Avoid stock phrases. Successful business is business plus personality. Good-will is the corner-stone. Be sincere. Be yourself. Write as you would talk. Put yourself in his place. Humor has its place in all adjustments. In order to have friends, one must be friendly, etc. Miss MacDonald's talk was splendid in every way and proved to be one of the best heard during the entire convention.

At 11.20 A.M., Mr. William Cairns, who is considered a master workman with children, read an interesting paper on "Photographing Children," after which adjournment was taken until 2 P.M.

Afternoon session called to order at 2 P.M., by President Rice, who introduced Mr. Pirie MacDonald, who gave a talk on "Reception Room Tactics." Speech was forceful, logical and eloquent. He has made the principal address at the New York Society convention for many years, and his words and work have always rung true, and it seemed to those present that his speech eclipsed any made by him in former conventions.

At 2.45 P.M., Mr. Walter Scott Shinn, a specialist in child portraiture, gave a very interesting talk on the "Proper Handling of Children" in order to secure the best results; also made a demonstration using a little girl as the subject, and made several negatives using light from a flash machine of his own make.

At 3.30 P.M., President Rice introduced Mr. Albert Sterner, a portrait painter of note, who gave the convention members practical advice on lighting and posing. His handling of the subject was scholarly and helpful, and he received the undivided attention of all present. Convention adjourned at 5 P.M.

Thursday morning session called at 10.30 A.M., by President Rice. The Secretary was asked to read a letter from Clarence H. White, who conducts a school of photography. Mr. White was scheduled to be one of the speakers at this session, but was unable to be present on account of illness, and his letter too lengthy to be inserted in the minutes, but of sufficient importance that it would seem proper to record a few of the principal thoughts. "Have respect and demand respect for the profession you are following. The public will grant respect if you will but demand it." "The greatest value of our product, I think, is not for today. It is for the future and a future of more than twenty-five years." "Every discovery that I have made and passed on has returned to me improved by its practice in other hands." "The fundamentals of picture construction can be taught and the far-reaching application of photography demands this study as much as establishing research laboratories to the development of the science." "The light should not be Rembrandt's, it should be yours." "Retouching takes away the character-making lines; therefore, use it with care." "Print with the greatest care, use care in everything you do, thereby creating the greatest respect for your profession."

President Rice then asked for report from different committees. The next convention will be held in Rochester. Time to be at their discretion.

The following nominations: For President, J. E. Mock; Vice-President, C. K. Frey; Secretary, B. J. Holcolm; Treasurer, Edwin Park. On motion, unanimously carried, the Secretary was instructed to cast one ballot for the persons that were named. All were declared elected and each accepted the office for which he was elected.

Mr. Frey moved that a vote of thanks be extended the Metropolitan Section for its interest, labor and many courtesies extended to up-State members and other members of the Society.

Treasurer Edwin Park read his report, which showed that the Society was in a prosperous condition.

Past-President Fred T. Loomis moved that the Treasurer's report be accepted and placed on file.

As partial recognition for his many weeks of labor, expended unselfishly for his society, Mr. Frey, in behalf of the members, presented to President Rice a beautiful upholstered chair, which Mr. Rice accepted with a very gracious speech.

Mr. Juan C. Abel, Secretary of the Photographers' Association of America, addressed the convention for a few minutes on the needs of the society and photography in general, after which Mr. Mock moved that the next convention be held during the month of May, which was carried. Mr. Hoyt thought the motion should be considered only as instructions to the Executive Committee.

It was not necessary to introduce Sam Lifshey, as every one seems to know Sam. He explained the moving picture "game" and made demonstrations, using as actors certain well-known members of the profession. The pictures were taken under the Butler-Sanker Super Power Light. It afforded instruction and not a little amusement.

President Rice called on Mr. J. Chester Bushong, who presented the following:

The Professional Photographers' Society of the State of New York in convention assembled passed the following resolutions:

Resolved, That the hearty thanks of this society be extended to the management of the Hotel McAlpin for housing this convention and extending us their many courtesies; be it also

Resolved, That we extend our vote of thanks to Miss Jessie MacDonald, Mr. Lejaren Hiller, Mr. Walter Scott Shinn and Albert Sterner, for so ably assisting on our program; be it also

Resolved, That we extend our vote of thanks to Mr. Willoughby and the Edison Co., for so kindly furnishing us the camera, electric equipment, etc., also to Mr. Butler of the Butler-Sanker Co., for the installing of a Butler Super-

Power Lamp for demonstrating purposes. And that the Secretary be instructed to forward a copy of these resolutions to the above parties.

Pirie MacDonald,
J. Chester Bushong,
H. A. Strohmeyer.

In conclusion, It appears that, from a social and business point of view, the New York Society has never held a better convention than the one just ended. Men high in the profession from Washington, Philadelphia, Scranton and Baltimore were present, in all thirty-nine members of note, who live outside the confines of the State.

On Wednesday noon a committee of New York ladies, headed by Mrs. Dudley Hoyt, entertained all the ladies at a luncheon at Shanley's, and at 6.30 in the evening the annual banquet and dance, interspersed with light comedy supplied by the members, was held at Hotel McAlpin. Concerning the picture exhibit, it was entitled to much favorable comment, and the writer feels impelled to say that it was the largest and by all odds the best exhibition that he has ever seen at any State convention. On motion of Mr. Mock, thanking the retiring officers, the 16th Annual Convention came to a close.

Geo. P. Personius,
Secretary.

Middle Atlantic States Convention at Atlantic City

The Middle Atlantic States Convention at Atlantic City the week of February 17th to 20th had the proportions of a national. The attendance was over five hundred, which was surprising and gratifying for the time of year.

In the picture competition, the Grand Prize went to Mrs. Standiford-Mehling, of Cleveland. As a whole the picture competitions did not find the response expected. Such competitions seldom do. The complimentary exhibit was excellent.

Instructive demonstrations and talks, some happy entertainments, a great showing by the manufacturers, good weather—all combined to make a first class meeting, and our congratulations are due to the hard-working president, J. B. Schriever, and his brother officers, J. W. Scott, George Kossuth and W. I. Goldman. Mr. Goldman, after serving as treasurer for twenty-four years, decided to resign and E. W. Brown, of Beaver, was elected to the position. J. W. Scott, of Baltimore, Md., was elected to the presidency; George Kossuth, vice president, and L. L. Higgason, of Asheville, N. C., secretary.

Northern Michigan Photographers Meet

Northern Michigan photographers held a meeting in Petoskey, Mich., on February 3, and completed the organization of a Northern Michigan Photographers' Association, with John Foley as President.

The object of the Association is to bring the photographers of the region into closer touch, both for the advancement of photography and for social gatherings. Dinner was served at the Braun during the evening, in honor of the out-of-town guests. The next meeting of the Association is to be held in Traverse City, July 1.

The officers elected are: President, John Foley, of Petoskey; Vice-President, George Priest, of Charlevoix; Secretary and Treasurer, George Bayes, of Manton.

New Photographers' Association Formed

On February 10th a number of Missouri professionals met at the Kassel Studio at Cape Girardeau, Mo., and organized the Professional Photographers' Association of South Missouri. Henry Moore, of Kansas City, President of the Missouri Valley Association, was the man responsible for the organization. William End, Perryville, is President; S. W. Spangler, Poplar Bluff, Vice-President; Julius Courtois, Festus, Second Vice-President; L. C. Mayes, Sikeston, Secretary; G .A. Kassel, Cape Girardeau, Treasurer. The next meeting is to be held in Sikeston in September, at the Mayes Studio.

New Hampshire Photographers to Meet

At a recent meeting of the executive committee of the New Hampshire Photographers' Association, held at the Kimball Studio, of Concord, it was decided to hold the 1920 meeting at Concord during the third week in April. New Hampshire photographers are very proud of the fact that their State is the only one in New England which has perfected an association. Claude L. Powers, of Claremont, is President; F. B. Wilson, Laconia, Vice-President; George W. Perry, Concord, Secretary-Treasurer.

Convention Dates for 1920

Missouri Valley Association—March 15, 16, 17, 18, Coates House, Kansas City, Mo. C. J. Fennel, Secretary, Columbus, Neb.

Southwestern Photographers' Association—April 26, 27, 28, 29, Headquarters not yet announced, Dallas, Tex. A. L. Blanchard, Secretary, Hillsboro, Tex.

Ohio-Michigan-Indiana Association—July 6, 7, 8, 9, The Breakers, Cedar Point, Ohio. A. E. Riley, Secretary, Coshocton, O.

Photographers' Association of America—August 23, 24, 25, 26, 27, 28, Headquarters not yet announced, Milwaukee, Wis. J. C. Abel, Secretary, 421 Caxton Building, Cleveland, O.

Photographer Association of Pacific Northwest—Date not yet announced, Headquarters not yet announced. Frank J. Lee, Secretary, Tacoma, Wash.

New England Photographers' Association—Date not yet announced, Headquarters not yet announced. Earl G. Mills, Secretary, 50 Arcade, Providence, R. I.

Metropolitan Section of Professional Photographers of New York

The Metropolitan Section of the P. P. S. of the State of New York held another of its informal dinners at the Hotel Astor, on the evening of

March 12. The dinner was given in honor of Mr. Elias Goldensky, and our guest of the evening was Mr. Robert E. Ramsey, Editor of *Advertising and Selling.*

A large attendance of the members were present, and on the occasion members were privileged to invite friends who might be eligible to membership. A goodly number accepted the invitation and signified their desire to join the section.

Mr. Hoyt greeted the members and guests in his usual sincere and kindly way. After the dinner and the cigars were passed the chairman in a few chosen words introduced Mr. Goldensky, who spoke of photography as a basic medium of art which should be grasped with intelligence, knowledge, and ability. He warmed up to his subject with enthusiasm which reflected his high ideals.

Following Mr. Goldensky, Mr. Hoyt introduced Mr. Robert E. Ramsey, who gave us a clean-cut talk on advertising.

Mr. MacDonald was called upon to say a few words, and in his usual forceful way gave an address that went straight to the heart. He spoke of the men who have been our honor guests during the past year, men of renowned ability who gave to us of their best graciously, unstintingly. He sounded a ringing note when he said that the Metropolitan Section should always stand for the best ideals, and the conduct of our establishment should be carried out on the highest plane of integrity, truth, and honor.

The closing year has brought to us a stronger bond of fellowship, and it has been an inspiration to all. The Metropolitan Section wants to be a power for good, a greater helpfulness to a greater fraternalism.

On the evening of March 31, at the Hotel Astor, a business meeting will be held for the election of officers for the ensuing year, after which a buffet lunch will be served.

L. L. DE AUÇUINOS,
Secretary.

Woman's Auxiliary of the P. A. of A.

AT the International Convention of the Photographers' Association of America, at Cedar Point, Ohio, last July, the Woman's Federation was disbanded and the Woman's Auxiliary of the P. A. of A. formed to take its place.

The purpose of the Woman's Auxiliary is to look after the comfort and welfare of the women attending the International Conventions, and to show how well it succeeds in doing this we quote the following extract from a letter recently sent to the chairman from a well-known manufacturer:

"I am especially grateful for the good time the ladies showed Mrs. ———. She had such a delightful experience. She declares she will never miss another convention. This is pleasing to me, as she never would attend one before, and it did us so much good to meet so many charming people."

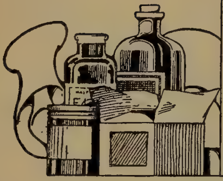
This letter shows the effect of the warm welcome given the newcomer by the Woman's Auxiliary, and it is their aim to make each and every woman who attends a convention look forward to coming to the next one.

The dues are one dollar per year, and the entire amount paid for dues is to be expended for the comfort and welfare of the women attending the conventions, of whom it is hoped that you will be one. Will you not become a member by sending one dollar to the Secretary-Treasurer, Woman's Auxiliary of the P. A. of A., ALICE W. CHAMBERS, 7321 Boyer Street, Mt. Airy, Philadelphia?

The WORKROOM

CONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

Intensification by Mercuric Chloride and Ferrous Oxalate
Developer Stain
Tracing Defects in Negatives
Glazing Without Waste
A Plea for the Workroom
Truthful Color Rendering
Platinum and Platinotype
Shading
How to Improve Quality
Streaks and Stains
Some Points in Copying.—IV
A New System of Photography
Varnishing Negatives
Photographic Materials and Processes
Patent News



THE WORKROOM

By the Head Operator

Intensification by Mercuric Chloride and Ferrous Oxalate

It is the aim of the scientific worker to get methods that yield definite results. A definite result is one that can be quantitatively foretold when the starting point and the process are known. With this end in view, I have done a good deal of work on intensification processes.

The value of intensification is not appreciated as I think it ought to be. Its chief advantage is that it enables the worker to increase the density of his negative after it has been critically examined. No such examination is possible during the development, so that if the desired density could have been obtained by further development, which is often impossible, intensification offers considerable advantage as compared with the alternative method. The discredit that intensification suffers from is doubtless due to the fact that it is regarded as a curative process for a fault that ought not to have existed (an essentially false way of looking at it), and also to the use of unsuitable methods or good methods in an improper manner.

It may be worth while, therefore, to set down the characteristics that render a method reliable: (1) It should produce an equal change throughout the whole negative; that is, every particle of silver should be acted on in exactly the same manner. To ensure this, every reagent must be allowed to act thoroughly, and must be unable to produce any other change than the desired reaction. It is especially necessary to guard against any dissolving (or in photographic language "reducing") action, because such a change must be uncertain, and it is hardly possible for it to be proportional, seeing that it cannot be complete. (2) The added matter must have no selective absorption; that is, it must be free from color, or it will vary in its effects according to the color sensitiveness of the surface exposed beneath it. (3) The final image should be permanent. (4) I think it is well that the method should be definite in the quantity of its effect; that is, not a continuous process, such as the deposition of silver on the image, as in physical development, because even if such a method could be relied upon to give a strictly proportional result, one would have to guess when to stop it, and there should be no guessing in a scientific operation. (5) And of least importance, the intensified negative should preferably be as amenable to further treatment of any sort as the original.

It should be understood that these *desiderata* refer to methods suitable for scientific work, and though doubtless generally desirable, exceptional cases will be advantageously treated by special methods. The mercury and ammonia, and the mercury and silver cyanide methods, for example, give unproportional and impermanent results. For negatives of line subjects that are only wanted for a few weeks or months, the want of permanency is no drawback, and the feeble intensification or, indeed, reducing effect that these processes show in the slightest deposits, is an advantage, as it tends to clear the lines. Again, the amateur is not very particular about the gradation of either his negative or his print so long as he gets a result that pleases him. The chromium method that Mr. C. Welborne Piper advocated may serve his purpose, although it gives a colored deposit upon the original image and an indefinite amount of it, and involves a dissolving action.

It is twenty-two years since I first publicly urged the merits of the mercury and ferrous oxalate method. The chief results of my comparative examination of this and other methods were published in January, 1890, January, 1893, and June, 1897; and from the strictly chemical point of view, in the *Journal of the Society of Chemical Industry* for 1893, p. 983. For nearly five and twenty years I have used no other method on negatives of value. I have seen scores of other people use it, and heard of the experience of many others. So far as I know, this method still stands where it did, as the only method that fulfils the conditions laid down, so that some of the results of this experience and a few new observations may be of value.

First, as to the permanence of the image. When a negative bleached with mercuric chloride is acted on by ferrous oxalate, the image that remains consists of an amalgam of silver, the metals being in the proportion of one atom of each, $AgHg$. If the process of intensification is repeated, each atom takes another atom of mercury and we get an amalgam in which the proportion of the metals is as in the formula $AgHg_3$. In practical negative making it is very rarely that two intensifications are necessary, therefore we are chiefly concerned with the first, but still, to a certain extent, with the second amalgam. I have prepared these two amalgams in bulk. The first is a gray powder, quite solid and dry in appearance, showing no indication that it contains the liquid metal mercury. The mercury in it is not in the liquid form. The second amalgam, $AgHg_3$, does contain liquid mercury, and a considerable proportion of clean mercury globules can be squeezed out of it by pressing a small quantity into a fold of chamois-leather, when mercury passes through the leather. This second amalgam, when in bulk and the bottle containing it is turned from side to side, reminds one of undried sand from the seashore, it retains the shape of the side of the bottle as it falls away from it. A small quantity of the AgHg amalgam lost mercury when heated in a steam oven at the rate of 0.47 per cent. per hour. This rate of loss would not continue, because to drive the last portions of mercury off from a silver amalgam needs a temperature equal to nearly the melting-point of silver. But this might be thought to indicate a possible want of permanency. The conditions, however, are widely different when, in a negative, the particles of amalgam are locked up in gelatin. A portion of a negative in which the image consisted of nearly 93 per cent. of mercury after heating at 100° C. for forty hours showed no loss of opacity whether varnished or unvarnished. Indeed, there was slight gain, due doubtless to the shrinking of the gelatin. This experiment was done twenty-one years ago, and the plate still appears to be unchanged. I have an experimental negative intensified in parts, once, twice, three times, and four times, which I showed to the members of this Society twenty-one years ago. It is here now, and the only sign of change in it is a metallic shimmer near the edge that is often seen on old unvarnished negatives, whether intensified or not.

A short time ago I made a further attempt to get evidence of the loss of mercury from intensified plates, by putting gold leaf on the surface of unvarnished pieces of negatives containing various proportions of mercury. These were left, each in a separate small box, for a month, and during eighty-four hours of the time were heated to a temperature of 85° to 90° C., averaging about 88° C. Assuming that the rate of volatilization of mercury is proportional to its vapor tension, this period is equivalent to something more than a year at ordinary temperatures. In no case could I detect any sign of mercury on the gold leaf, though one plate contained fifteen times as much mercury to the silver, as in the case of one intensification, and I made a few cuts with a knife across the film to let the mercury out if possible. Gold leaf placed 30 mm. above a globule of mercury was well whitened after four hours at 85° C.

A negative intensified sixteen years ago—not experimentally, but in the ordinary course for the sake of the print—and varnished, shows absolutely no sign of change. I do not know of any case in which change is evident, and select this negative as an example only because I happen to have a print made before and one made after intensification.

Thus by different methods and repeated and prolonged experiments I have been unable to get any evidence of loss of mercury from intensified plates even when the metal is present in a very much larger proportion than it ever would be in ordinary work. It may, then, be fairly claimed that the image so intensified is permanent. But there is also the fact that the whole of the silver of the original image remains in the metallic state, and that if it were possible to lose all the added mercury, the silver itself would remain as at first. This is not the case in many other methods, as, for example, when either sodium sulphite or ammonia is used instead of ferrous oxalate.

Failures to work this process successfully have sometimes come to my knowledge. That the fault is not in the process is obvious, and as further proof of this, I would say that I have repeatedly, for other than strictly photographic purposes, intensified plates up to seven or eight times without any difficulty or irregularity. The slightest fault in the earlier operation would in these cases have finally become very conspicuous.

Insufficient fixing or washing will lead to irregular deposits. The fixing should be prolonged, preferably in a new or little used bath, after it is apparently complete. With regard to washing, ordinary analytical methods that have sometimes been applied to determine when the washing has done all that it can do, are not serviceable, any more than they are to determine the suitability of a sample of silver nitrate for emulsion making. Even the best designed washing troughs have their faults, and will not wash the plate clean in constantly running water in an hour, and the results show that the water moves in currents. I suggest washing for two hours at least, and in any case to allow the last hour's washing to be in a flat dish, changing the water every ten or fifteen minutes. I do not know of any reagent that will by its "destructive" or other action on the hyposulphite appreciably lessen the time necessary for the washing. The irregularities due to want of proper care in these matters are not at all peculiar to this method of intensification.

A plate so fixed and washed should lead to no trouble. But if hard water is used, there will be a deposit of calcium oxalate, and perhaps a very little brownish basic iron compound on the film, and this is unsightly. The calcium oxalate will disappear on varnishing and can do no harm. The iron deposit is generally so very small, if present at all, that it may be neglected. If an attempt is made to rub off such a deposit from a dry negative, it will almost certainly be made dirty or the film will be damaged. But it is possible to get rid of such deposits by washing the plate for a few minutes after the use of the oxalate and then putting it into hydrochloric acid (the strong acid diluted with ten to twelve times its bulk of water) until the deposit has dissolved, which may require up to three or four minutes. Mr. W. E. Hogg pointed out the practicability of this method to me, and obtained perfect results after two intensifications with roll-film negatives. These films having gelatin on both sides are much more troublesome in this respect than plates coated on one side only. The method certainly succeeds also with many makes of plates, and without undue risk of frilling.

A difficulty that sometimes presents itself, though not in any sense peculiar to this process, is the reticulation of the gelatin when the weakly acid mercuric chloride is put on it. This is probably a question of the gelatin used by the maker. I think that any plate ought to withstand the action of such reagents. Having the acid in the mercuric chloride solution reduces the tendency in this direction.

Developer Stain

Every photographer at some time or another has had the experience of finding that his negatives in the course of development and fixing have become badly stained. The novice is apt to conclude that it is the fixing-bath which has caused the stains, because these do not usually become apparent until the negative is in the hypo, or even at the subsequent washing stage; but they are developer stains, none the less.

A fixing solution, unless it has been made up with some quite extraordinary inaccuracy, cannot cause stains at all. It is true that hypo reaching a sensitive film before or during development may cause it to become stained. But even then it would not be strictly correct to attribute the stain to the direct action of the hypo; while, after development, a fixing-bath as such is incapable of staining.

The developer it is which is at fault; yet, as a rule, not so much the developer itself as the method of its use. All the ordinary developing substances readily oxidize: if they did not, they would not be of service as developers. The product of the oxidation is in every case some compound or compounds of a strongly colored nature; and it is to the presence of these that the developer stains are due.

To prevent or, rather, to delay the formation of these compounds, sodium sulphite or similar substances are used in the developer; and if they are present in sufficient quantity, staining may be made almost impossible. The quantity necessary varies with different developing agents; but there is an objection to the presence of a very great quantity of sulphite, as it in its turn will give rise to fog—"sulphite fog."

It is usual for a formula to give sufficient sulphite to prevent stain when the developer is properly used; but not so much as to bring on any danger of sulphite fog. It is important, therefore, no matter what developer is employed, to see to it that we do nothing to encourage the formation of developer stain.

In passing, it may be well to point out that the power of sulphite to prevent stain is in proportion to the strength of its solution, and not in proportion to the quantity of the developing agent. To be strictly accurate, therefore, if we dilute a developer to slow it down, we ought to dilute it, not with water, but with a solution of sulphite, as strong in sulphite as the solution which we are diluting. The drawback to this is that it tends to cause sulphite fog; as, although the diluted solution is actually no stronger in sulphite, it is relatively stronger; and the dilution making the development slower, the film is exposed to the sulphite solution for a longer time, and so gets fogged.

Many workers have noticed that prolonged tank development in a very weak developer, instead of giving very clean negatives, often results in foggy ones. This is caused by the sulphite fog; some of the tank developer formulæ being particularly strong in sulphite, to prevent staining from oxidation. On the other hand, if we dilute a developer freely with plain water, the color of the resulting negatives will be different from that of those developed with a solution of the full strength; because dilution has altered the proportion of sulphite to water.

The oxygen which causes oxidation of the developer is derived primarily from the air. Water will dissolve a good deal of oxygen, which is expelled on boiling; and it is for this reason that we are advised to use boiled water for making up developer solution. If the water is boiled briskly for a few minutes, and then allowed to go cold without much agitation, it will be comparatively free from dissolved oxygen. Stock pyro solutions made up with such water will be of quite a different color from solutions made up to precisely the same formula and from the same lot of chemicals, but with unboiled water. On diluting a pyro developer with plain water, it is seen to go brown at once, from the same cause; although if sufficient sulphite is present, it will speedily clear again.

Anything which exposes a developing solution to air is to be avoided, as it tends to provide the oxygen which causes oxidation. Hence the advice when making up stock solutions of a developer, not to put the whole lot into one big bottle, which would be opened many times in the course of use, and toward the end would be a bottle chiefly containing air, with just a little developer on the bottom.

Instead, the stock solution should be divided into small lots, each being put into a separate bottle, which is full right up to the neck, and in which, if the cork is a sound one, it will keep almost unaltered for a very long time indeed. Pyro solution is regarded as one of the developers which do not keep very well; but we have had pyro solutions, made up with boiled water, and put into well-corked bottles, which kept unaltered, both in appearance and in developing power, for many years. Within the last few weeks we have been using a stock solution of pyro made up before the war. In that case, it was from a bottle which was only partially full all the time; but it was well corked, and had not been opened. The oxygen which was in the air included in the bottle had been absorbed, and more had entered, doubtless, and been also absorbed in its turn; but not enough to affect the solution appreciably.

When a developer is diluted for use, it is not customary to do so with boiled water, but with water from the ordinary supply, containing a good deal of dissolved air. Hence we at once provide material for oxidation. More oxygen is absorbed from the air, as the process goes on, the alkalinity of the developer rendering it much more active as an oxygen absorbent. The solution gradually discolors, owing to the formation of these oxidation products; but with a sufficiency of sulphite present, the discoloration will not go far enough to stain the film. How far it can go is easily seen by leaving the developer in the open dish for a day or two after use. On going back to it we find it a thick brownish black liquid, with a scum upon the surface that stains all it touches.

When a negative is taken out of the developer, its film is full of a solution which, given the opportunity, will turn to what we see in the dish just referred to. The coloring matter formed is solid, and, being formed within the pores of the gelatin itself, and not being readily soluble in anything we can apply which will not injure the gelatin, it causes an almost indelible stain. It is of the greatest importance, therefore, to get the solution out of the gelatin before such a change can take place.

For this reason, it is advantageous to give the negative a rinse before putting it into the fixing solution. For the same reason, the fixing-bath should be rocked from time to time; as we have to rely upon it, not only to fix the image, but also to wash out most of the developer.

Staining from oxidized developer is not likely to occur, if these two points have attention, so long as the film is kept well under the surface of the liquid; as, while there, it is not very much exposed to oxygen. With negatives on glass plates, the weight of the glass keeps them lying on the bottom of the dish, under the liquid; but with celluloid films, and particularly with paper prints, there is a tendency to float on the surface. This exposes the film of gelatin to the oxygen of the air; and if the film still contains an appreciable quantity of the developer, it will in all likelihood become oxidized, and stains will form. —*Amateur Photographer.*

Tracing Defects in Negatives

THE perfect result in photography is dependent so essentially on the absence of the many conditions which can introduce defects that it is difficult for anyone but the individual worker to say with any certainty what is the cause of spots or fog or any of the miscellaneous ills which beset gelatin negatives. Yet, despite this fact, it is part of our daily work to do what we can to locate the cause of one defect or another in negatives which are sent to us by our readers. Without wishing to discourage any of these latter from their habit of seeking such help as we can give them, it must be admitted that in many cases all that we can do is to make a guess at the cause and to leave the correctness of our guess to the further judgment of the inquirer. In some instances, perhaps, our suggestion may indicate a cause which had not been thought of; in others, no doubt, such cause had been definitely eliminated by the inquirer's knowledge of his working conditions. At any rate, it seems useful to offer a few notes on the general plan which may be followed in endeavoring to come to a decision as to the cause which makes a negative defective in one way or another.

Probably the defect which is most frequently brought to our notice is a general fog or veil over the negative. In this connection it seems not to be realized by many querists that very different causes may lead to an almost identical effect, and that the solution of the problem lies more in an examination of the working conditions than of the negative. From the latter it is impossible to say whether the fog is light fog or chemical fog, that is to say, if it is produced by extraneous action of light in conjunction with a properly compounded developing bath or has its origin in the faulty development of a plate which has been exposed only to light reaching it in the correct manner through the lens. Certainly the negative does give some slight guide in these circumstances—namely, by the appearance of the narrow margin of the plate which usually is shielded from light during exposure in the camera by the rebate of the dark-slide. If this narrow edge is reasonably clear and free from fog in the negative, it follows that the cause of the fog must lie in the kind of image which is formed on the plate, and cannot very well be the result of a faulty developer or an unsafe dark-room light, either of which would affect the plate up to its extreme edges. Thus the condition of these rebate edges in the negative is a first hint of the direction in which to look further for the cause of the defect. If the edges are clear, the fogging of the plate is most probably due to a dirty condition of the lens or to the illumination of the inside of the camera to an extent which can cause a general veiling of the plate during the period of exposure. The two things often go hand in hand, but even when the lens is free from a coating of dust which causes it to distribute light on to the plate somewhat like a window of frosted glass, the conditions may be such that the fog comes from light reflected from the interior of the camera on to the plate. The wide-angle over which the modern anastigmat covers is responsible for fog from this cause; the interior folds of the bellows come within the cone of illumination from the lens and cause veil by reflection on to the plate. It is here that a lens-hood or a diaphragm placed within the camera proves to be of decided benefit. The reputation of the older types of R. R. and single lenses for bright images probably arises as much from their deficiency in angle of illumination as from their optical qualities *per se.* Moreover, the use of the wider angle anastigmat has extended along with a reduction in the dimensions of cameras and with the growth in popularity of the taper bellows, which explains why a given lens will yield brilliant negatives free from any suspicion of veil on an old-fashioned camera of the square-bellows type, while an exactly similar lens in a taper bellows camera will give trouble from veil.

When we come to the causes of general fog over the whole area of the negative one of the things which will, of course, occur at once is want of safety in the dark-room illumination. This may arise either from leakage of white light into the dark-room or from passage of actinic rays through the safelight of the dark-room lamp. A little hint as regards the former is worth mentioning, since we know that it has proved the means of tracing leakage of light which remained undetected until it was used. It is simply to lay a piece of mirror in the empty developing dish, and with all lights extinguished to examine the mirror for any reflection of light. It may happen from the special way in which a dark-room has been fitted up, often by partitioning off part of a larger room, that outside light finds it way to the developing dish from a source which cannot be seen unless one can take a look round exactly from the position which the plate occupies. The mirror enables one to do this. As regards the dark-room light itself, the production of fog from this source is readily detected by the usual plan of laying a plate in the developing dish in total darkness, at the same time laying one or two coins on it. If then the dark-room light be turned on and the developer applied for, say, ten minutes, the presence of any insecurity from this cause should be revealed by the production of the outlines of the coins on the plate. In making such a test as this it is too often forgotten that the safety of a dark-room light increases considerably with the distance from it; it will not do to make the test with the developing dish three feet away and then expect an equal safety of illumination if plates are handled or developed close to the lamp.

If tests for the unsafeness of the dark-room light yield only negative results, the trail for fog must be followed in the composition of the developer or in its contamination during use. We have known of cases where fog which for a time baffled detection was traced in the end to using the anhydrous instead of the crystallized form of sodium carbonate. By practically doubling the proportion of carbonate in the developer it is obvious that with many formulæ fog is bound to be produced. But perhaps the most common cause is contamination of the developer with hypo, brought about very often through belief that the dark-room towel, which is regularly in use for wiping fingers which have dabbled in the fixing-bath, actually cleans them thoroughly from hypo solution. As we emphasized in a note not long ago the dark-room towel too often serves as a distributor of hypo, and a rule should be made of keeping it to its proper purpose, which is for drying the hands after they have been rinsed from any chemicals under the tap.—*B. J.*

Glazing Without Waste

Now that toned and glazed bromide postcards are being issued to stationers at seven shillings per gross, and in some cases at less than that, it must be pretty clear that if there is to be any profit at all the percentage of waste must be reduced to the utmost limit. If we go into the matter thoroughly we are compelled to admit that at least nine-tenths of the waste that accrues is due to faults in the glazing or enamelling process. Where an allowance of 5 per cent. for waste is calculated in the case of matt or ordinary unglazed cards it is often doubled in the final process, and this is mainly due to the fact that employers are apt to look upon glazing as a process that can be dealt with by any unskilled hand, and often the work is allotted to boys or girls receiving a remuneration of a few shillings per week. The writer has had charge of the glazing department in a large publishing firm, and has thoroughly tested every known and some few hitherto unpublished methods of glazing the thick bromide paper used for postcards with a view to eliminating every chance of waste. At the outset it is of no use, for commercial work, to use anything but glass as a basis, and where possible it is better to use plate-glass, although 21-ounce is a good substitute, and has the advantage of being much cheaper. When the glasses are new they should first be thoroughly cleaned with very weak ammonia or soda water and whiting, then dried, and again cleaned with methylated spirit. This may at first sight seem to be an unnecessary expense, but experience has proved it not to be so. Very little spirit is required—just a few drops poured from the bottle on to the center of the glass, and then polished with a soft duster, taking care that *both* sides of the glass are operated upon. After the glass has been used once it should never again be cleaned with anything else but methylated spirit—water or spirit and water will not do—and it will be found that all markings caused by the edges of the cards and splashes from the squeegee on those portions of the glass which have not been covered by prints will clean off very easily, and a splendid polish can be obtained with very little labor.

Having the glass or glasses thoroughly clean and bright, the question arises in what way to prepare them so as to prevent any risk of sticking. One method, which is now very popular, is to coat with dilute oxgall; the contents of one gall-bladder added to 40 ounces of water will be found to give satisfactory results. Care must be taken that the gall is fresh, as if it has gone bad it is worse than useless; the mixture should be filtered before using, and then applied in the same manner as the spirit which has been used for cleaning the glass, with the difference that while the spirit was used sparingly, the oxgall should be somewhat more lavishly employed, and care must especially be taken that the extreme edges of the glass receive their due quotum.

This method is undoubtedly a good one—the prints come off easily and with a good surface; the only drawback is that should the solution go bad and be unwittingly used the prints will stick. Petrol may be employed instead of oxgall, but of course in a pure state, and the great drawback in this case is that it must not be used in a room where there is gas or any artificial illumination other than electricity.

With the glasses cleaned and polished with methylated spirit, it will be found that the most certain means of ensuring the prints all coming off properly is again to polish with French chalk (powdered talc); the system is one of the oldest, and in the opinion of experienced workers is still the best, but bear in mind that the chalk must be properly rubbed into the interstices of the glass and *all over it*, not, as some boys or girls do, rubbing it on and then off again. It must be borne in mind that the object in French-chalking the glass is to provide a substratum which will prevent the prints from sticking to the glass when dry, and not, as some workers seem to imagine, further to clean and polish the glass. The prints should be then taken from the water and laid in their places, and when the glass is filled they should be covered with a piece of waterproof sheeting and lightly squeegeed with a flat squeegee; those on the first side can be examined to see that there are no air-bubbles left, but it must be obvious that when the second side is filled they cannot be so examined, and, therefore, care must be taken that the squeegeeing is thoroughly and effectually done. All that now remains to be done is to get the pictures dry, and not only dry, but in just the condition that they will either drop off the glasses on their own account or will strip off without any necessity to pull them—in fact, they should only need one corner raising for them to at once detach themselves bodily; and here it will be found that one of the most necessary elements of successful glazing is drying the prints properly and thoroughly, and knowing when they are just in the perfect condition for stripping. Spontaneous drying is what is really required, and heat should never be applied, as with any trace of moisture in the paper there will be at once a tendency to partially melt the gelatin, and even if the print is taken off the glass entire it will be found to be marked or cracked where the partial melting has occurred.

It will be found far the best to place the glasses in a rack (and not close together) in a room in which a fire is burning, but the rack should not be placed near enough to the fire for the heat to be appreciable. What is required to dry the pictures in a proper manner is simply dry air. In fine weather they may be successfully dried in the open, but should on no account be placed in the hot sun. Drying should be complete in a space of about three hours, but if the atmosphere is damp the time is naturally prolonged, and if prolonged to excess failure is almost sure to result, as the gelatin has a tendency to decompose if exposed too long to damp.

It will be seen by the foregoing that the main elements of success are: (1) thorough cleansing of the glasses with spirit; (2) thorough and careful French-chalking; (3) *natural* drying. With the ordinary thin paper a gentle heat may sometimes be applied after the print is surface dry and is required in a hurry, as for press work; but with the thick or postcard paper, even when the surface appears perfectly dry, there is still moisture beneath the surface, and the application of heat will at once generate steam and cause melting of the film, and directly melting occurs sticking is bound to follow.

Should a glass become faulty from scratches, a piece of paper should be stuck on the side where the defects are, so that when preparing the glass that side should not be accidentally chalked and covered with prints, as might otherwise easily occur when many glasses have to be prepared, and sometimes in a poor light.—*B. J.*

A Plea for the Workroom

You spend money on your reception-room, your window, or your showcase—on paint, wall-paper, carpets and furniture—and you know that whatever you spend on these things will bring you, in the long run, a handsome return.

But what about your workroom? Are you trying to save money by starving your workroom? If you are, you are adopting a short-sighted policy.

A comfortable, well-equipped workroom helps to increase your profits. It means less waste, better and more uniform prints, and a more contented spirit among your assistants.

Heating and ventilating are too often neglected in workrooms. Even in many otherwise high-class establishments the workroom is like an ice house in winter and like a furnace in summer. No assistant, however conscientious he may be, can do his best work when handicapped by such conditions.

There are some photographers who, for want of space, can get nothing better than a cellar or an outhouse to use as a workroom. But even in these cases a great deal can be done, at very little expense, toward making the working conditions comfortable. It does not cost much, for instance, to cover a cold, damp, concrete floor with boards, and to fit up a stove. Neither does it cost much to make sure that fresh air can get into the room, and that bad air and the fumes from the sulphide bath can find an easy exit. A little outlay of this kind ensures more than comfort in working —it saves material. You cannot expect sensitive plates, films and papers to keep their freshness if you subject them to damp atmosphere, chemical fumes and frequent changes of temperature.

Then in equipment many photographers allow their workrooms to remain hopelessly out-of-date. This is difficult to understand in cases where so much is spent in keeping the rest of the premises smart and modern. Have you ever considered what a serious drawback it is not to have a handy means of getting hot water in a workroom? Do you know that an assistant is apt to get into the slovenly habit of relying on guess work unless you provide him with a thermometer, a pair of reliable scales and suitable graduated measures? Do you know that you run a risk of sending out pictures that may very soon deteriorate, unless you have the right dishes and a good big sink where your prints can be thoroughly washed?

There are still many professionals who refuse to take advantage of modern labor-saving devices. In some workrooms the old method of wet mounting is still used. The advantages of dry mounting, both in the saving of labor and in the improving of work, are so well known that there is little excuse for the photographer who clings to the old brush and paste method.

The same applies to printing. In many workrooms assistants have to get off large batches of bromide or gaslight prints—and every print has to be made in an old-fashioned printing frame. This waste of labor goes on in many establishments in spite of the fact that a modern printing machine can be bought for a few dollars. Such a machine enables a printer to do six times the amount of work in a given time, and to do it better, than he could ever hope to do with an old printing frame.

You know how much sensitive paper you buy from month to month, and you can easily keep an account of the number of prints of various sizes that a month's supply of paper gives you. Find out how much goes in waste. Further, note the average time spent on making a dozen prints. When you have got these facts together, bring your workroom up to date—make it comfortable, make it convenient and instal efficient labor-saving devices. The figures at the end of the first month's working under the new conditions will show you that your money has been well spent.—*Professional Photographer.*

Truthful Color Rendering

The average photographer is, I think, inclined to be somewhat conservative and loath to change from his customary practice. Further than that, like everyone else who has practised photography, he has become so saturated with the totally erroneous color-rendering of the ordinary plate that he is inclined to consider a really truthful rendering as false.

If we compare the sensitiveness of the eye with that of the ordinary plate, the falseness of the color-rendering becomes at once apparent. The plate sees nothing but ultra-violet, violet and blue; the eye practically nothing but blue, green, yellow and red, with yellow as the brightest color; that is to say, those colors which are visually bright, appear black to the ordinary plate.

No one who makes a real trial of panchromatic plates will ever go back to the ordinary or even to the isochromatic. Only the color worker knows how much red there is actually in nature. It is true that one does not always want the extra red sensitiveness, and while one need not always take advantage of it, it is just as well to have it as a reserve force—it is like a balance at the bank, always handy.—E. J. Wall, F.R.P.S.

Platinum and Platinotype

The price of platinum metal, which has continuously pursued a strong upward course during the period of the war, has quite recently experienced still further advances, which bring it almost up to the figure of $200 per ounce. This high price, which we mentally compare with that in our student days when platinum crucibles were purchasable at the rate of $10 per ounce, must necessarily have a very great effect indeed upon the cost of manufacture of that most beautiful photographic product, platinotype paper, for although we do not know the proportional cost which platinum represents in platinotype paper, we do know that the other chief material, namely, the raw paper itself, has advanced in price by something like 300 per cent. On inquiry of the Platinotype Company as to the possibility of platinotype paper being still obtainable, we have learned that during the war the sensitive material had been sold without profit and last year below cost, and it is now compulsory to advance prices materially. We are thus brought to a point at which it will depend upon the support afforded by photographers whether platinum printing shall continue to exist. All we can say is that it will be a thousand pities for the process to disappear from the media of both portrait and amateur photographers. The costly nature of platinum is now widely known; and nobody could resent paying a high price for permanent prints in that metal.—*B. J.*

Shading

It is a matter of some difficulty when shading a portion of a negative, when printing, to prevent a more or less hard outline where the shaded part merges with the rest of the picture. When printing-out paper is employed the usual and the more satisfactory method of shading during the exposure is by the use of a piece of card moved backward and forward over the part of the negative that it is desired to retard; yet this plan tends to give hard edges. A good way to avoid this defect is to cut a series of fairly deep saw-like segments into the card at its edge, bending these in an upward and downward direction alternately. This idea is based upon the old-fashioned paper mask or vignette used years ago, the edges of which were cut in the same fashion as the teeth of a saw. It will be found that if the plan mentioned above is carried out and the printing frame kept in fairly weak light during the exposure a very much softer result will be secured and probably one that will give no indication that shading has been done. With development papers it will also serve, providing the printing light is well diffused and the card kept in motion. Of course, the idea cannot be carried out with the printing machines and boxes so much used today. If a negative needs local shading the printing frame should be employed, when the above method will be found to repay a trial.—*B. J.*

How to Improve Quality

How can I improve my work?

The complete answer to that question would require the writing of a book, not because the work of photographers is poor, but because there is no one spot on which you can put your finger and say, there is the place where photographers should improve.

To make a good lighting, and a correct exposure for the lighting, is probably the most difficult thing in producing a photograph, and since it is difficult there is a great chance for the improvement of negatives that, upon development, are found to be overexposed, overdeveloped, or too contrasty.

The man who makes the negatives can improve, but he will always make *some* mistakes. We will not take up his work in this article except to show how his mistakes may be corrected.

We will assume that the negatives which represent a day's work have been developed. Let us also assume that the man who made the negatives has also done the developing. Is he capable of judging their quality? He should be, and very often he is. But for the sake of argument, let us assume that he only thinks he is and honestly wishes to improve the quality of his work.

When he has carefully examined his day's work and feels satisfied, suppose he were to call in the printer and ask his opinion as to the printing quality of the negatives he has just developed. Would the printer be able to tell him anything?

We think he would. If the printer is not able to tell what result he will be able to get from a negative before he prints it, he is not going to be able to produce the best results. He deals only with negatives and prints and should be a good judge both of negative quality and of print quality. He may not know just what effect the photographer was trying to produce, but he should and usually does know what effect he will get in his print from the negative that has already been produced.

If you really want to improve the quality of your work, and if you think the printer is not doing justice to the negatives you are making, why not call him in and get his opinion. Perhaps it is a long time since you have done any printing, and if this is the case it would help you to print from some of your negatives and see in what way they are falling short of the quality they should have to make good prints.

You must always bear in mind that you don't sell your negatives. It's the print that the customer buys.

We will suppose you have been convinced that some of your negatives are at fault. You should not have to wait until those negatives have been dried and proofed to know just what they need in the way of correction. You should correct these defects immediately after you have given your negatives their final washing, otherwise they are not likely to be corrected.

If a board is too long you can saw it off, but if it is too short you know how much of a job it is to splice it and make it longer. We think the same way about intensification. Except in the case of ample exposure and underdevelopment intensification does little good.

But proper reducers, properly used, will accomplish wonders. There are three reducers that will each produce a different result of a corrective nature, and if you don't use them whenever a negative needs correcting you are not taking advantage of one of the simplest means at your command for making an improvement in your negative and print quality.

The three reducers are the ferricyanide, commonly known as Farmer's reducer; the persulphate, and the proportional reducer. The ferricyanide reducer removes silver from all parts of the negative alike, and, as exposure adds density to all parts of the negative to almost the same extent, it is readily seen that the ferricyanide reducer is the logical one to use for negatives that have been overexposed. It is also a valuable reducer for foggy negatives, since it clears the shadows and increases contrast as it reduces density.

Farmer's Reducer

A

Water	1 oz.
Potassium ferricyanide	15 gr.

B

Water	32 oz.
Hypo	1 oz.

Add A to B, and use either as a general or local reducer. Wash negatives thoroughly after reduction. The ferricyanide may be kept in a stock solution but should only be added to the hypo when ready to use. This solution may be made up by merely adding sufficient ferricyanide solution to a 1 to 4 solution of hypo to make it lemon yellow.

Suppose a negative is properly exposed and developed, but is too contrasty. Possibly the light was stronger than you thought it to be, and the contrast must be reduced to make the negative printable. In this case you need a reducer that will affect the high-lights to a greater extent than the shadows. It has always been claimed that permanganate would produce such an action, but in reality its action on the high-lights is so little in excess of its action on the shadows that it is hardly worth mentioning. Persulphate, however, does attack the high-lights far more than other parts of the image, so the high-lights *can* be reduced without affecting the shadows and contrast materially reduced.

Persulphate Reducer

Water	32 oz.
Ammonium persulphate	1 oz.
Sulphuric acid	160 min.

When reduction is complete, immerse in an acid fixing-bath for a few minutes, then wash.

These reducers have enabled us to correct two mistakes of the man who made the lightings and exposures, but they do not help us in correcting overdevelopment. The longer we develop the more we increase the density of all the points of gradation proportionately. To make this readily understood, we might say that if 5 represents the deposit of silver in the shadows, and 100 the deposit of silver in the high-lights, overdevelopment that adds 1 part of silver to the shadows will add 20 parts of silver to the high-lights and proportionately to the half-tones in between.

A reducer that will correct overdevelopment must reduce proportionately, and while there may not be the same need for such a reducer that there is for the other two, it is well to know that one can correct overdevelopment as well as overexposure and excessive contrast.

Proportional Reducer

A

Potassium permanganate	4 gr.
10 per cent. sulphuric acid	½ oz.
Water	32 oz.

B

Ammonium persulphate	2 oz.
Water	64 oz.

For use take one part of A to three parts of B for three-minute reduction. Following reduction it is advisable to immerse the negative for five minutes in a 1 per cent. solution of bisulphite of soda, then wash for a few minutes.

Any one of these reducers may be used for local reduction. The usual method is to apply the reducer with a swab of cotton, dipping the negatives in running water occasionally. But if the proper reducer is used, local reduction will not so often be necessary.

Improve your negative and print quality during the year 1920. Study negative quality, talk printing quality with the printer, and don't let negatives go as good enough if you can improve them as we have here suggested.—*Photo Digest.*

Streaks and Stains

With most skilled photographers clean work is the rule, but others, who are often blessed with a considerable amount of artistic and manipulative skill, find many of their productions marred by various defects in negative or print. In the present state of plate and paper manufacturing it is unwise to attempt to fix the blame upon the materials or to change from one make to another in the hope of effecting an improvement. In one respect only is there likely to be any fault in this quarter, and that is by reason of plates or paper having deteriorated through long or careless storage.

The most fruitful cause of imperfect work is to be found in neglect of small details of manipulation, especially when the worker is almost entirely ignorant of the elements of chemistry; he may then be meticulously careful in unessential details, while he may fall into grave errors on vital points.

Staining of either negatives or prints may be general over the entire surface, or occur in streaks or patches, the latter being more disfiguring and more common. It may occur at almost any stage, and it is not always easy to determine the cause unless careful observation is made during the entire process of the work. For example, the commonest cause of staining in intensification is imperfect fixing, though insufficient washing between bleaching and blackening is usually blamed.

Imperfect fixing, either through too short an immersion in a fresh bath, or the use of an old solution nearly saturated with silver, is a most prolific source of stains in negative films. In either case, local or general yellowing may take place after a few months, even if the negative is not treated in any way. It is desirable to follow the old rule of noting the time taken for the unaltered bromide to disappear, and to continue the fixing for a further period of the same duration. If more than five minutes are required to produce the visible effect it is advisable to renew or strengthen the solution. If a negative is intensified, such unwanted silver immediately manifests itself in the form of a yellow stain, the density of which depends on the quantity present. It is therefore advisable to allow even more than the prescribed time for fixing if there is any prospect of intensification being necessary. In the actual process of intensification stains are frequently due to insufficient washing after bleaching, by either the mercurial or chromium solutions. In the former case there is no visible indication of the thorough removal of the mercury, but in the latter the presence of the yellow tint, given by the chromium, is a guide, washing having to be continued until this is removed.

Stains frequently occur during reduction with either ferricyanide or persulphate. In the former method too weak a hypo solution or the use of an acid solution is usually to blame, a trace of hypo in the film being, of course, harmless. With persulphate, the presence of hypo will, if evenly diffused through the film, delay, or even prevent, the action, while, if present in patches, as when a plate has been handled with hypo-contaminated fingers, it will cause black patches to appear. Insufficient time in the sulphite of soda "stop" solution may cause stains, and if intensification is to follow reduction, a short immersion in the ordinary fixing-bath should be given to remove any traces of silver salt which may have been deposited in the film.

Bromide prints are liable to staining from the same causes, which act, in the case of negatives, if they have to be reduced or intensified. The iodine-cyanide reducer is greatly to be preferred instead of ferricyanide, as with it there is practically no risk of staining, while the chromium method is the best for strengthening or improving the color of rusty prints.

In sulphide toning stains occur if the fixing has not been thorough, as it is obvious that if any unaltered bromide is left in the film it will darken in the sulphide simultaneously with the bleached image, a slight trace often causing a more or less brown tint upon the high-lights or margins of the prints. Uneven coloring and weak patches arise from inadequate washing after fixing, the hypo combining with the ferricyanide in the bleacher to form the well-known "Farmer" reducer. Such patches may also be caused by putting too many prints at once into a small quantity of sulphide solution. In this case the water carried in by the prints dilutes the solution locally and gives rise to the effect produced by the use of too weak a sulphide bath; this usually occurs with large prints, and once it has taken place no further immersion will even up the tone.

A general stain over bromide prints may be caused by prolonged development, the use of a solution which has been oxidized by use or exposure, or by an excess of developer, being carried into the fixing-bath upon unrinsed prints. Stains of this nature usually yield to treatment with a very dilute iodine-cyanide solution, as do stains caused by keeping the paper too long before use.—*B. J.*

Some Points in Copying—IV

HAVING the copying apparatus fitted up in the way suggested in our first article we may find other uses for it than copying as ordinarily understood. It is a fundamental of factory management that machinery must be kept fully employed if it is to be profitable. Enough work, therefore, must be found to cover rent of the space occupied, interest on capital sunk in the apparatus, depreciation of apparatus, and the ordinary profits, after labor and materials have been provided. Such additional work is in the nature of copying, and consists of reproducing negatives, making latern slides, and occasionally bromide enlargements.

We say this work is in the nature of copying, because the adjustments, focussing, setting of conjugate distances, and so forth are the same, the difference being that instead of working from a print and using *reflected* light, we work from a negative or a transparency, using *transmitted* light. Clearly, the main difference will be the illumination.

When an upper room is used and there are no obstructing buildings near it may be feasible to make all the adjustments with the apparatus horizontal, clamp the cameras to the board on which they slide, and then raise one end of the whole equipment so that the lens is looking through the negative at uninterrupted sky. A sheet of clean ground glass is usually necessary on the sky side of the negative, and perhaps a couple of inches away. This equalizes the illumination and protects the negative from chance spots of rain. We do not advocate this method, however, because a very solid board must be used in all copying work, and the weight of such with the cameras on it is quite considerable. Further, the risk of the whole collapsing is not to be overlooked. It is no easy matter securely to attach to its board a 15 by 12 camera extended a distance of thirty or forty inches.

The alternative when working by daylight is to keep the board level, pointing out of the window, and to use a large matt white reflector fixed outside the window at an angle of 45 degrees. One is surprised at the size of reflector needed, especially if reductions are being made from large negatives, and a somewhat short focus lens is used. Here, as in most other cases, the greater the focal length the better. A good reflector is made by an artist's canvas of ample size, painted white with matt oil paint. It is unaffected by a shower, may be washed, is cheaply repainted, is light to life in and out, and may readily be kept taut by the wedges of the stretcher.

With either of these daylight methods one is more or less at the mercy of the weather, and there is the further disadvantage of variable light, though that may be overcome to a great extent by the systematic use of the actinometer and classification of negatives and transparencies. Further, the negative must be supported in a carrier, and the space intervening between the negative and the lens of the copying camera must be covered in so as to prevent any light reaching the lens other than that passing through the negative. This is most conveniently managed by the use of the second camera. Thus, if a 15 by 12 enlarged negative is being made from a half-plate transparency, the latter may be placed in a carrier in the 1/1 plate slide, the tin division removed, and both of the shutters drawn. The slide is put into position and the camera placed on the board with its front pointing toward the interior of the room. The baseboard projecting somewhat beyond the transparency will not be any disadvantage, but it should be arranged that such projection is as little as possible. The front panels of the 1/1 plate camera may be removed if necessary, for the working lens attached to the front of the 15 by 12 must be just against the front of the 1/1 plate, but so that the stops may be manipulated. The 1/1 plate camera must be packed up with blocks of wood or a flat box so that the center of the transparency is opposite the lens on the 15 by 12, or, better still, the smaller camera may be mounted on a sliding saddle of the proper height. We thus have two cameras turned front to front, the one looking into the other. For reductions the positions will be reversed, the lens always being on the working camera, of course. Then the baseboard of the large camera may in some cases project inconveniently, though this may be minimized by the careful choice of the lens. Given attention to the points we have mentioned satisfactory results may be obtained with little trouble.

But the use of artificial light confers so much advantage that we advise it in preference to daylight, particularly if electric light is available. Broadly, three methods exist, which are: (1) direct light diffused by ground glass; (2) direct light with a condenser; (3) light reflected from a dead white surface.

We may dismiss the first, merely remarking that it is not a workable method unless the mercury vapor light is used. Then, by arranging the tubes in the form of a gridiron, large negatives may be illuminated and the cost of a big condenser is saved.

The use of a condenser is familiar to most business photographers, and with the addition of a sheet of ground glass to diffuse the light it is excellent for enlarging on to bromide papers.

For negative reproduction and slide making we should prefer the incandescent lamps on account of their ever-readiness and cleanliness. They are rapid enough, whereas arcs are sometimes rather too rapid for convenient working. The apparatus consists of a rather flat box, say, 26 inches square and 9 or 10 inches deep. This is set up on one end, and the back is detachable and is covered on the inside with a sheet of dead white cardboard. The front has a centrally-placed opening 15 by 12 with carriers for other sizes of negative down to the smallest. Close to the front in the space of 6 inches between the edges of the largest negative, 15 by 12 and the sides of the box, are placed the lamps, carefully wired up on two switches, and so arranged that no direct light will reach the negative, but that the white card will be flooded evenly with light, which is reflected through the negative. If one switch controls half of the lamps some economy in current may be effected during focussing, etc.

But if we exercise a little care we may work without adding much to our print equipment, for if we can illuminate a print of that size evenly for copying, we can illuminate a similar area of white card for reflecting light through a negative or transparency. Anything up to 10 by 8 may be managed with two lamps, either incandescent gas or electric light, and if four can be arranged it should be possible to illuminate 15 by 12 if the distance between the lights and the reflector is increased a little.

Fix then on the copyboard a large sheet of smooth white card or uncreased cartridge paper. In front of the copyboard, but so that the distance may be varied when required, fix another similar board with 15 by 12 opening and nested carriers. This will hold the negative and at the same time keep all light out of the lens except that passing through the negative. The side light will do no harm, but if it is any source of worry to the operator's eyes it may be cut off by strips of thin wood lined with sheet asbestos. The reflector of sheet-iron, which should be arranged to keep the direct light from reaching the negative, should also keep off any heat which would be likely to crack it.

If only small negatives, say up to 1/1 plate as a maximum, are to be illuminated one of the "paraboloid enlargers" may be used, and would be found very convenient for such work as the making of sets of lantern slides from small negatives. But we advocate the larger arrangement for general work because one can never afford to be limited as to size, while nothing larger than 15 by 12 is likely to come along in the average business. These paraboloid enlargers, of course, are intended for use with one's own camera, and consist of one or two lamps and a suitably curved reflector, which throws the light through the negative.

Apart from the making of enlarged negatives it will be found an advantage to have these additions to the copying equipment because of the handiness of being able to reproduce a negative. Every worker gets negatives, of his own or clients, which are excessively thin or dense, but which for various reasons he does not care to run the risk of intensifying or reducing. He may have been in the habit even of making a *contact* transparency and another negative from that, again by contact, and if so he will probably have found a more or less serious falling off in quality. But working by projection this loss in quality is reduced to negligible proportions. Further, a reversed negative may be made as easily as one non-reversed. We need say little as to producing a negative of different character, beyond advising the use of a process plate where the original is excessively flat. But while it is easy to get more, or less, strength in the new negative it must not be forgotten that *like produces like*, and any defect such as absence of shadow or high-light gradation will be reproduced.

Working with artificial light the exposures will present little difficulty if the negatives ordinarily used are classified. The ratio of exposure to scale of reproduction will be the same as given for print copying. One point must be watched—the distance of the lamps from the white reflecting cardboard and the distance of the negative or transparency from the same. It would indeed be well to keep to standard distances for various sizes of negative, possibly one distance up to 10 by 8, and a slightly greater one for 12 by 10 and 15 by 12. Of course, the greater distance is given to equalize the illumination as between margins and center, but this weakens the light actually passing through the negative.

With regard to the occasional bromide enlargement, a sheet of paper may be sandwiched between two sheets of glass, placed in the dark-slide and exposed just as in the case of making an enlarged transparency, and though the method is not equal to the ordinary one in point of convenience it is useful now and then if the enlarging-room is hard pressed with work.—*B. J.*

A New System of Photography: Contact Prints From Opaque Dyed Negatives

A PROCESS, or rather system, of photography is on the eve of being placed upon the market, and will assuredly arouse widespread interest since it represents a radical departure from the methods of making and printing negatives now in common use. This is the process to be known D. I. P., an abbreviated name derived from the title of the issuing company, Messrs. Dye Impressions Photos, Ltd., of 24 St. Mary Abbott's Terrace, Kensington, London, England. The process is the outcome of the experimental work carried out for some years past by Mr. F. W. Donisthorpe, to whom we were recently indebted for a demonstration of it. The process is so essentially different from the customary system of making and printing a negative that we may first state, in the briefest possible form, in what it consists.

A negative is made on ordinary dry-plate emulsion, which may be on either an opaque or a transparent support. The transparency of the support does not matter in the process because prints are made, not by exposing through the negative, but by taking contact impressions from the negative without any action of light. For this purpose, the negative is converted by a very simple operation (taking about ten minutes only) into a state in which it can be dyed up in a dye bath, and when it has been thus dyed, prints can be taken from it by simple application of gelatin-coated sheets of paper, a period of contact of about one minute sufficing to produce each print. The prints made in this way, with the materials to be supplied, have all the appearance as regards tone and gradation of first-rate gold-toned P. O. P.'s.

Such, in brief, is the D. I. P. process, which, we learn, is to appeal to the favorable notice of photographers on several grounds. To the amateur it is pointed out that the materials for photography on this system can be supplied very cheaply, since the sensitive material for exposure in the camera will be emulsion-coated paper in the form of cut sheets or daylight spools, and will thus be saleable at a price approximating to that of bromide paper. For the making of the prints, the requisite paper is still cheaper, while the only other material required in making the prints, namely the dye bath with which the negative is treated, represents an infinitesimally small cost per print. In the field of professional photography, the process is advanced as having a considerable industrial application for the reproduction of photographic prints, for instance, such as are known as cinema "stills" and for the production, at a low cost, of copies of plans, drawings, and other documents in any required number, large or small. In work of this kind, a negative is first made from the original on bromide or gaslight paper, either by contact in a printing frame, or, if necessary, by enlargement or reduction with a lens. This negative then forms a dye-printing surface from which copies are taken on gelatin-coated paper, or even, in the case of commercial reproduction of large photographic prints or line originals, on paper of the kind used in ordinary typographic printing under the names of "Art" and "Imitation Art."

So much for the general outline of the process and its applications commercially and to the hobby of photography. In the practical working of the process the negative is developed as though it were a bromide print, that is to say, the shadows of the subject should be white, while the high-lights are represented by a moderate deposit of silver, such as one obtains in the shadows of a vigorous bromide print from a negative. In other words, overexposure, particularly when coupled with overdevelopment, is as harmful to the satisfactory working of the process as underexposure is in the making of ordinary negatives. It is pointed out that this feature is an advantageous one in the process, since it enables exposures in the camera upon an emulsion of given sensitiveness to be very much shorter than would be required (by the same emulsion) if the object were to make ordinary negatives.

The negative having been made, it is fixed and washed in the ordinary way, and when dry is treated in a special bath sold as "preparing bath," in which it is kept, with occasional rocking, for ten minutes. In this bath the negative image on the paper is bleached to an extent which depends upon the negative paper utilized. Ten minutes is stated to be a sufficient time for any negative, but longer immersion in the preparing bath does no harm. The negative is then rinsed under the tap or in a dish of water for half a minute, and is then immediately placed in the dye bath, in which it remains for a time ranging from five to twenty minutes. The shorter times suffices for negatives which are of the right quality as regards freedom from deposit in the shadows, whereas the longer immersion is needed for those which have been overexposed or overdeveloped, or are defective in both of these ways. Although longer immersion will do something to compensate for errors of exposure and development, the results are not so satisfactory as when exposure and development have been at the minimum.

In this dye bath the negative image changes to a positive one, showing all the details of the subject of a color very similar to that of a well-toned P. O. P. print, but with a greenish-yellow shade over the high-lights. The picture is, of course, also somewhat degraded by the quantity of dye solution adhering to the "negative," but it clears somewhat on rinsing it under the tap for a few seconds, as requires to be done preparatory to taking an impression from it or to examine the degree of completion of "dyeing-up" a negative during its period of immersion in the dye bath.

The operation of printing from the dyed negative is very simple. A sheet of gelatin-coated paper is soaked in plain water for a couple of minutes, and while fully wet—in fact, with a pool of water on it—is laid face up on a glass plate. The rinsed negative is then held above it in a loop, brought down in contact with the wet paper, and immediately squeegeed into contact. For the first impression from the negative the period of contact is about two minutes; about one minute for subsequent prints. The negative is taken off, and the print then requires no further treatment beyond quickly drying by heat before a fire or over a spirit flame or gas ring. Considerable heat may be used as the coating on the printing paper is hardened, and rapid drying is, in fact, necessary in order to prevent unsharpness in the copies due to slight "running" of the dye which takes place if the impression is allowed to remain wet for any considerable time.

One or two prints having been taken from the negative, a further dyeing of the latter is required, but needs to be only for a very much shorter time, about twenty seconds, so that it may be said that once a negative has been given its first dyeing, fully finished prints can be made from it at the rate of about two minutes for each one. The dyed negative can be dried in the ordinary way and kept for subsequent use. When further prints are wanted, it is only necessary to soak the negative in water for five minutes and then to give it about twenty seconds in the dye bath.

In thus describing the D. I. P. process, we have assumed that the negative has been specially made for it, but we should hasten to point out that any existing negative of quality such as has been already described, whether on glass or celluloid, can be used in the process, with the single difference that in making the prints the negative is laid face up on the glass plate and the printing paper lowered upon it. It ought to be added that the process is intended to apply to a silver image such as is obtained by ordinary development and fixing. While it is possible that the D. I. P. preparing and dye baths will work satisfactorily with negatives which have been reduced or intensified, it is obviously scarcely a fair method of giving the process a trial to use for it negatives which may have undergone changes, as regards the hardness of the gelatin, through being subjected to some after-process of intensification or the like.

Of the precise theory of the D. I. P. process we can only form conjectures until technical particulars of the preparing solution and the dyes are disclosed on the publication of Mr. Donisthorpe's patent specification. It will be seen, however, that the process is, in a measure, akin to pinatype, although we are informed that pinatype dyes do not work with it. In pinatype, it will be remembered, a print-plate is made by exposing a film of bichromated gelatin under a positive made from the original negative, the image, in hardened gelatin, being obtained on washing and drying the print-plate which was thus exposed. One obtains in this way an image of hardened gelatin corresponding with the original negative, and as the pinatype dye is taken up by the parts of the film which remain unhardened, there is produced a positive dye-image of the original which can be transferred to paper by contact. In the dyed D. I. P. "negative" we have presumably a surface bearing the same relation to the original subject as does a pinatype print-plate, but one which has been obtained by a much more expeditious method, the making of a positive transparency and a bichromate print therefrom being replaced, in the D. I. P. process, by the single and far more rapid operation of treating the negative in the preparing solution. Further, in the case of the pinatype process, not only were 20 minutes or so required to transfer the dye to the paper, but the print had to be dried slowly, whereas, as previously stated in the D. I. P. process prints may be obtained and dried in two minutes. It deserves to be said that the short cut, as we have had the opportunity of seeing it employed, works excellently. Certainly it adds quite a new sensation, even to those familiar with photographic processes, to see a negative print so rapidly converted into a dye-printing plate, and to note the admirable quality of the impressions then taken from it.

In concluding this first general account of the new process, we may say that Messrs. Dye Impression Photos, Limited, are taking steps to bring it before the notice of photographic societies throughout the country, by sending to most of them a supply of materials together with negatives, both normal or dyed, so that the process may be demonstrated. Secretaries of such societies as do not receive these materials should note that they may be obtained on application, since they will provide a most interesting fixture to occupy the whole or the part of an evening.—*B. J.*

Varnishing Negatives

NOWDAYS the average photographer does not varnish his negatives; he takes no steps to protect their surfaces from deterioration or damage from finger-marks, from the action of the air and its impurities, or from staining by contact when damp with printing papers. In the collodion days varnishing was a necessity, because the film was so tender that it could be damaged by mere contact with the paper on which the print was going to be made. The gelatin film on a negative today is much more hardy, and we can rub its surface, handle it freely, and make a number of prints from it without doing it the slightest injury.

Is Varnishing Necessary Now, or Not?

Are we to conclude from this that varnishing is no longer necessary? By no means. On the contrary, the writer is absolutely convinced of its necessity if we wish to keep a valuable and a good negative in all its pristine excellence. There are, in short, other forms of deterioration besides those which are produced by contact with the fingers or with the printing papers.

The Deterioration which a Negative may Undergo

What worker has not been surprised on opening an old box of negatives to find that they have completely changed, both in tone and in intensity. Chemical actions have gone on, giving the film in parts a mirror-like appearance, showing that there has been the reduction of some silver salt in the film to the metallic state, making the negative, perchance, quite useless. And the cause of this? The action of the air, undoubtedly. Had the negative been duly varnished, it would have been protected from the effect of the atmosphere and its impurities, and would have remained in its pristine condition. Every good negative, therefore, it is contended, should be varnished, not merely for the mechnical protection which the coating gives to the film, but also to prevent the action of damp and air, which, in time, will destroy it. There is still another frequent cause of injury to negatives, and that is the damp which brings about incurable yellow stains and black marks, when it gets to negatives in contact with papers containing soluble salts of silver, such as P. O. P. The stains are specially likely to be troublesome in winter, when the paper often has to be kept in contact with the negative for a long time, printing being slower.

A Formula for a Good and Cheap Negative Varnish

An excellent varnish for negatives can be made by dissolving bleached shellac in alcohol in the following proportions:

Alcohol, 90°	10 oz.
Bleached shellac	1 oz.

These ingredients are placed in a corked bottle and kept in a warm room, and well shaken up every other day for a week or more. The mixture is then set aside for two or three weeks to settle, after which the clear liquid is carefully decanted and bottled up for use. A great number of different resinous substances have been recommended at different times for use in varnishing negatives, the characteristics of a good varnish being that it shall be colorless, very transparent, giving a hard coating impermeable by moisture, not softening from warmth, and, above all, drying quickly.

A Retouching Varnish

A very good varnish may be made by dissolving an ounce of gum benzoin in ten ounces of alcohol. Sandarac gives a varnish which will take the pencil readily, and so is suitable for retouching upon. The following formula has been found an excellent one:

Alcohol, 90°	1 oz.
Sandarac	60 gr.
Castor oil	15 gr.

How to Varnish a Negative Properly

Most of these varnishes ought to be applied to negatives that have been warmed, but the temperature of the plate must not be raised to such a height that it becomes difficult or impossible to get an even coating on account of the alcohol evaporating too quickly. A degree of heat that is just comfortable to the hand will be found best. The varnish is poured on at one corner, a free movement of the hand holding the plate causes it to flow to each in succession, and it is finally poured off from the fourth corner, which should be the right-hand one nearest the operator, into a bottle furnished with a funnel containing a filter, which may be a tuft of cotton-wool. When the varnish no longer drips—the plate should be rocked a little to prevent it from forming lines—the corner of the plate is rested for a few moments on a piece of blotting paper, and the negative is once more warmed for a minute or two and then set aside in a rack for the varnish to harden. The warming is best carried out over a gas stove, with a metal plate lying upon it to equalize the heat and to prevent any chance of the naked flame of the stove setting fire to the varnish. The whole plate should be evenly warmed, or dull opalescent patches will occur on it.

A Varnish to be Used Cold

There are also varnishes which do not need any warming of the negative, but it is very important in this case, as in the others, that the plate shall be thoroughly dry before coating. A good varnish of this type is made of:

Anhydrous benzine	10 oz.
Gum dammar	1 oz.

If Negatives, Why Not Prints?

When once we admit that it is important to varnish every valuable negative, it is clear that it is even more important to varnish matt surface bromide prints, which are exposed still more to risk of damage and to the action of impure air. We do not refer to a varnish which shall appear as a glossy coating over the whole print, but a light, protective layer, which, while just brightening up the deeper shadows, in itself an advantage, shall protect the whole print from the air, as in the case of a varnished negative.

How to Varnish a Print

An excellent varnish for this purpose is the above described gum dammar one, but it should be more dilute. Half an ounce of the gum to ten ounces of the benzine will be found most suitable. This varnish is particularly suitable for large prints which are going to be framed. The print is first stuck down upon a stiff card, and is varnished when it is thoroughly dry. It requires a little dexterity, but this is soon acquired. This is how we do it: The varnish, carefully filtered and quite clear, is poured into a bottle with a fairly wide mouth, which is closed with an ordinary cork. This cork is pierced with two holes and fitted with two small glass tubes. One of these tubes extends to within half an inch of the bottom of the bottle, and projects about half an inch outside. The other tube, with its end drawn out and curved round in the flame of the spirit lamp, only passes a very little way into the bottle and has its outer end projecting two or three inches from the cork. The mounted and dry print is held in the left hand and the bottle of varnish in the right, and a sufficient quantity of the varnish to cover the print is poured out by means of the drawn out end of the tube. This is made to cover the whole print by a movement of the left hand. Care should be taken not to pour out too much varnish, and when the print is completely covered, it is tilted a little and the excess is allowed to run into another bottle provided with a funnel and a filter, the contents of which after filtration are returned to the first bottle again.

Varnishing Unmounted Prints

Unmounted prints can be coated with varnish in the same way, by attaching them by means of drawing pins to a flat board which is tilted to an angle of about 45 degrees. The varnish is poured over the print, starting at the top, and by a backward-and-forward movement the whole is covered. Great care has to be taken not to let any of the varnish get on the back or it will cause marks which will not disappear on drying, and will be especially visible in the lighter portions of the picture.

An Important Point

A matter to be noted in making this varnish is that the benzine must be perfectly anhydrous; any trace of water in it will cause the varnish to dry matt in parts.

A Water Varnish for Prints

Prints which are to be mounted with white margins may be protected with a water varnish applied cold. For this purpose thirty grains of borax and thirty grains of bleached shellac are taken to each ounce of boiling water. The mixture is boiled for from two to three hours, adding fresh water to replace that which boils away. The liquid is then cooled, filtered, and bottled for use. To varnish a print with this preparation we need not wait until the print is perfectly dry. After fixing and the washing is complete, it is put between absorbent "fluffless" paper to remove the excess of moisture. After leaving it there for a few minutes, it is taken out and immersed bodily in the water varnish for five minutes, and simply hung up to dry. It is then ready for mounting. This treatment has the advantage that it renders the paper throughout completely impermeable, and therefore is a thorough protection to the print. It also greatly facilitates mounting, for the print no longer expands to any extent on moistening, and the moisture of the mountant does not penetrate the paper and make the film itself sticky, which is so often a great trouble to amateurs when mounting bromide prints.

Better to Buy than to Make

It is perhaps as well to add, in conclusion, that all these varnishes and preparations, and many others for the same purposes, are to be obtained commercially, and that most people will find it simpler and more satisfactory to buy them ready made than to attempt their manufacture.

Photographic Materials and Processes

Process plate; emulsion for photographic. R. E. Slade and G. I. Higson. *Phot. J.*, 1919, 59, 260—265.

THE characteristic curve of a photographic plate as determined by Hurter and Driffield's method has been found to depend on the relation of the different sizes of silver halide grains present and their quantities, the thickness and opacity of the film, and the time and method of development, the first of these factors being the most important. Regarding the curve of an emulsion as the sum of the curves due to the various groups of particles of the same size, it follows that, in general, the more uniform the grains of an emulsion the steeper its curve. The actual size of the grains is less important than the degree of uniformity. A plate for process work requires to have a steep curve, and therefore to have uniformity in size of grain. Photomicrographs of a number of commercial process plates, of which several are reproduced, support this view.

Photographic toning with nickel and cobalt. J. Dubreton. *Bull. Soc. Franç. Phot.*, 1916, 6, 304.

Solutions of nickel and cobalt ferricyanides are both suitable for toning bromide prints. Considerable latitude in the composition of the baths is permissible, the solution recommended for nickel being a mixture of equal parts of solutions containing respectively 1 per cent. of potassium ferricyanide and 2—5 per cent. of potassium citrate in water, and 1 per cent. of nickel chloride and 2—5 per cent. of potassium citrate. The tones obtained vary from a deep, warm brown to a red similar to that obtained with a copper ferricyanide solution; the intermediate tones, however, are pleasanter than those given by copper, and there is less tinting of the whites if toning is carried to finality. For cobalt toning, the second solution contains 2 per cent. of cobalt nitrate or chloride with 6 per cent. to 10 per cent. of potassium citrate; a violet-rose tint is given, very effective in portraits. Hard prints are preferable, and the strength of the bath in cobalt must be maintained to avoid reduction of the print.

Sharp-cut selective [*light*] *filters; Experiments in the use of —— in spectro-photometric researches. I. Dependence of gradation on wave-length with gelatino-bromide of silver.* A. Hnatek. Z. wiss. Phot., 1916, 15, 271–288.

Some of the filters described in a previous paper (see preceding abstract) were used for determining the relation between the wave-length of the light, to which a plate is exposed, and the gradation of the resulting image. Exposures were impressed by means of a tubes-photometer (Everhard's modification) with revolving plate-holder, which was first carefully calibrated by the aid of a series of uniformly exposed and developed plates of various densities which were found to be free from scattering effect and without selective spectral absorption. In order to obtain similar effective exposures with the same exposure time for different color-filters and different plates, use was made of the same series of neutral densities to modify the intensity of the light in the gradation experiments. This use of an intensity scale permitted the employment of the expression $S = a + bm + cm_2$, in which S is the density of an image produced by a light intensity I, $m = -2{\cdot}5 \log. I$ and a, b and c are constants which can be determined experimentally for each plate. Gradation, G, is then $dS/dm = b + 2cm$; in the case of certain plates, such as See plates with a very long straight-line portion of the sensitiveness curve, $S = a + bm$ and $G = b$, *i. e.*, is independent of the intensity of the light. The wave lengths of the color filters were taken as the "effective" wave lengths, *i. e.*, in each case the wave length indicated by the mass center of the area included between the horizontal axis and the spectrum curve of the particular light filter and plate; effective wave lengths were determined for the Elko plate as representing ordinary plates, and for the color plate as representing orthochromatic plates. A number of tables are given of the results with five brands of ordinary plates and three brands of color-sensitive plates (not panchromatic). The filters were selected in each case to cover the range of spectral sensitiveness of the plate. The curves obtained by plotting gradation against wave length show in all cases an S-formation, rising from short wave lengths up to a maximum, for ordinary plates at about $\lambda = 4500\mu\mu$, falling to a minimum, and then rising again to about $4900\mu\mu$; the chromatic plates show more variation both as to the position of the maximum and its height.

PATENT NEWS

Color photography. C. Raleigh, Jersey City, N. J., and W. V. D. Kelley, Brooklyn, N. Y., Assignors to Prizma Inc. U. S. Pat. 1,325,204, 16.12.19. Appl., 20.12.16.

In obtaining a color record, the exposure is made through a moving graded color screen, so that one end of the exposure is made to practically white light and the other end to the full color.

Absorption spectra of a series of aniline dyes and the selection of spectrum bands by means of gelatin filters. A. Hnatek. *Z. wiss. Phot.*, 1915, 15, 133—148.

For use in the spectro-photometric examination of stars a series of single-band selective color filters was prepared, varying both in the position and in the width of their transmission. Over 60 dyes were examined as to their light-absorption, and of these 24 were selected for preparation of the filters; a full list of the dyes is given, with a description of their properties and their absorption spectra as determined by a Coudé spectrograph on Wratten and Wainwright's Panchromatic B plate. The filters were made in the usual way as gelatin film; where more than one dye was used in a filter they were mixed if possible, but coated separately if there was such interaction between the dyes that the absorption of the mixture was not the sum of the absorptions of the separate dyes. The filters (thirty-six in all) were of three types, passing wide bands of about 1000 A. U., narrower bands of 500—900 units, and narrow bands of 200—4000 units respectively. The composition and spectrum of each filter are given. The absorption of the extreme red was not satisfactory in some of the filters, as only two dyes (Naphthol Green and Toluidine Blue) were found with an absorption in this region, and the Toluidine Blue has too much general absorption for use in these light filters.

Vol. 57. No. 5 May 1920 20 Cen

The Photographic Journal

of America

Smithsonian Institution
MAY 11 1920
National Museum

Published Monthly
With Illustrations

Efficiency in the Printing Room

can never be obtained with make-shift or antiquated equipment. A reliable, scientifically correct, modern printing machine is essential in the production of work of highest quality.

The Ansco 11 x 14 Professional Printing Machine is designed for general use. It is easy to install, economical to maintain and uniformly dependable as to light.

PRICES and full description of this Printer and other Ansco professional apparatus for photographic studios will be mailed on request.

ANSCO COMPANY
BINGHAMTON, N. Y.

NEW YORK
129-131 West 22nd St.

SAN FRANCISCO
171-173 Second St.

CHICAGO
308 N. Michigan Blvd.

TORONTO
347 Adelaide St., W.

THE PHOTOGRAPHIC JOURNAL of AMERICA

REGISTERED IN THE UNITED STATES PATENT OFFICE

NEW SERIES: WILSON'S PHOTOGRAPHIC MAGAZINE

AN ILLUSTRATED MONTHLY DEVOTED TO THE SCIENCE AND ART OF PHOTOGRAPHY

THE OLDEST PHOTOGRAPHIC MAGAZINE IN AMERICA
Founded 1864

Incorporating:
The Philadelphia Photographer **The Photographic World**

THOMAS COKE WATKINS, Editor

CONTENTS FOR MAY, 1920

Arrangement of the Group . . . . . James Watt 171
The Perspective and Values of a Photographic Business 174
Thoughts on Style . . . . . F. C. Tilney 176
Some Considerations of Straight Photography and Control . . . Anthony Guest 179
Editor's Table—To Our Readers—Posing Men 183
The Studio—Practical Papers on Studio Work and Methods 184
Abstracts and Translations . . . . . E. J. Wall, F.R.P.S. 187
Views and Reviews 189
The Workroom 192

YEARLY SUBSCRIPTION, **in advance, postage paid, United States, Mexico, Cuba, Philippines and Porto Rico, $2.00; Canada, $2.35. Countries in the Postal Union, $2.75. Single copies, 20 cents.**

REMITTANCES **may be made at our risk by money order, check, draft, or registered letter.**

SUBSCRIPTIONS **begin with current issue.**

Published by EDWARD L. WILSON COMPANY, INC.,
THOS. C. WATKINS, President. 701 Arch Street, Philadelphia, Pa.
EXECUTIVE and EDITORIAL OFFICES, CAMERA BUILDING, 122 EAST 25th ST., NEW YORK CITY
HOUGHTON'S, Ltd., London, Eng., Agents for Great Britain
American News Co., Distributors for U. S. Kodak Australasia Ltd., Sydney, Agents for Australia
RICHARD HILL, Devonport, Auckland, Agent for New Zealand

Entered at Philadelphia Post-office as Second-class Matter

This is one of a series of sketches on Leading American Photographers.

American Photographers

L. L. HIGGASON:—If you were asked to tell something about Asheville, N. C. you would probably say "Why, that's the place that Higgason comes from." Without doubt "Higg" is much better known among photographers than his home town. Why? Because he has the happy faculty of making people *live again* on paper.

In recognition of his ability to make good pictures, Mr. Higgason has been awarded various cups, certificates and honors. At the present time he is also secretary of the Middle Atlantic States Photographers' Association.

Good photography is mostly dependent on "the man behind the gun", although good equipment, intelligently selected, undoubtedly plays an important part. Higgason wisely uses a complete battery of Wollensak objectives, including a Velostigmat Series II F:4.5, Vitax F:3.8 and Verito Soft Focus F:4 and says he couldn't afford to be without one of them.

Our catalog shows some of Mr. Higgason's work and describes our complete line.

Your copy will be sent you free, on request.

The Velostigmat F:4.5, which was Mr. Higgason's first Wollensak lens, is here illustrated in barrel, but can be furnished in other mountings if desired. The Vitax and Verito complete Mr. Higgason's lens equipment.

WOLLENSAK OPTICAL CO.

ROCHESTER, NEW YORK.

AMERICAN MADE **REXOLON** DEVELOPING AGENT

Rexolon is a new universal developing agent. Rexolon offers unusual, distinctive and important advantages over all other developing agents.

1. Rexolon is chemically pure and lasting.
2. Rexolon is distinctive for the non-oxidizing qualities. It will stand in an open solution twice as long as German metol
3. Rexolon is non-poisonous to the skin, a characteristic which will appeal to all subject to metol poisoning.
4. Rexolon is a soft developer, greater contrast can be obtained by the addition of bromide, which within certain limits does not affect the tone.
5. Rexolon will produce good blacks and whites even if the negatives are under or over exposed.

Rexolon is being rapidly stocked by all photo dealers. It will pay you to give it a trial.

Put up in one, four and eight ounce bottles, also in one pound bottles.

One ounce bottle........................$1.35

CHICAGO = Burke & James Inc = NEW YORK

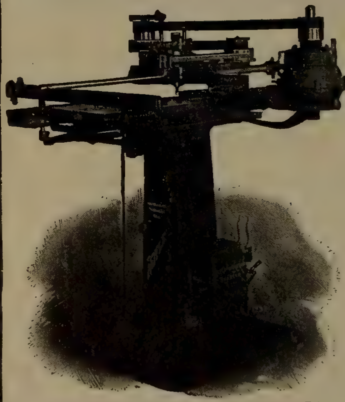


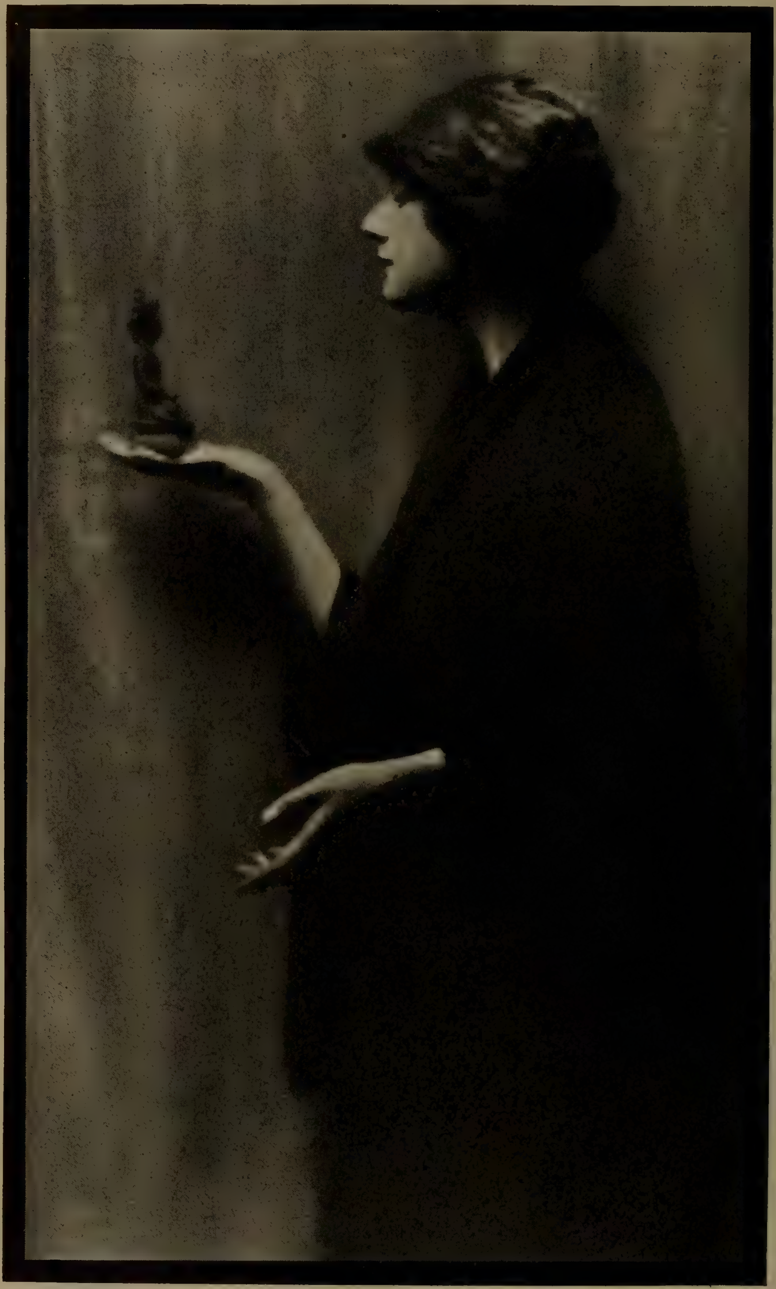
PLATE FINISHING

machines for the photo-engraver. Carefully and expertly constructed to give pleasing continuous service and the most practical advantages. Every operation provided for.

WRITE FOR PRINTED MATTER

JOHN ROYLE & SONS, PATERSON, N. J. U. S. A.

Routers, Lining-Bevelers, Saws, Trimmers, Router Cutters, Etc.



BY ARNOLD GENTHE
NEW YORK CITY

The
PHOTOGRAPHIC
· JOURNAL ·
· of AMERICA ·

VOLUME LVII MAY, 1920 NUMBER 5

· FOR · THE · PROFESSIONAL · PHOTOGRAPHER
THE · AUTHORITY
PJ A
FOUNDED 1864

Smithsonian Institution
MAY 11 1920
National Museum

ARRANGEMENT OF THE GROUP

By JAMES WATT

THE further we advance in what may be justly termed artistic photography, the more we emancipate ourselves from that monotony of subject which has overruled the photographic representations of the last twenty years, the more pressing become the questions as to how, after the difficulties of the single picture have been successfully dealt with, other difficulties may be similarly overcome. One of the most difficult, perhaps the most difficult of all tasks undertaken by the photographer, is the efficient representation of several persons in one picture—the group. The group must consist of a number of single pictures together, but may not be broken up into isolated pictures. The space, looked at from a distance and as a whole, must appear filled with lines and forms expressing life and action as well as a certain amount of design. However simple these requirements may sound, they demand of the photographer artistic sympathy, much study, and patience.

He must be acquainted with the laws regarding the structure of a picture; he must know the principles (akin to those of pictorial art) of composition; he must be able to separate the important from the unimportant, and to combine, suppress, or tone down accessories.

It seems, therefore, not out of place to write about these requirements, as only on the sound basis of knowledge and capability can art in photography be developed and protected from the so-called "works of art" which have so little to do with art.

Many of our up-to-date practising photographers do not possess energy, ambition, or love of their calling sufficient for self-education, and in thinking over the decline of the photographic industry we are forced to come to the conclusion that a considerable part of the blame is due to many professionals lacking knowledge and ability. It has been recently remarked that the beginnings of photographic portraiture indicated progression along similar lines to those now worked upon by the great bulk of photographers.

Originally, photography was practised by artists and by real art lovers, and we have pictures from among those "beginnings" which might well serve us as examples. This opinion is shared by many competent judges. When we consider how vastly superior are photographic materials of the present day to those of forty years ago, we think it would be well to investigate the reason of this retrogression and also find out the differences between the early photographers and those of today. Any connoisseur would tell us that the difference lies in the conception of the subject. We might reply: "Other times, other views," but nature remains the same. We would not wish, of course, to banish all that is modern—fresh methods of expressing beauty must ever be given a place of their own—but the fact remains that the point of view of most photographers is a very narrow one, and in only exceptional cases are we striving to repair the ravages of the photographic "man of business."

Formerly group photographs were taken by painters, men of artistic taste. How had they the advantage over us, seeing how far behind us they were in technic? They possessed artistic feeling, which we lack. They knew of nature from their own studies, whereas we know nature only through more or less bad copies. If we wish to overtake them we must, at least, use good instead of bad copies, and, above all things, we must return to nature.

With regard to the good copies, we can earnestly recommend our readers to obtain some of the beautiful reproductions after pictures by the old masters. They are comparatively very cheap. It is not enough, of course, for these pictures to be casually glanced over and then placed in an album. Their value may not be appreciated until the master's work be pondered over and studied carefully for perhaps a year. Let the student hang these, in simple frames, upon his studio wall; let him constantly look at and compare them (however useless this may at first appear) with his own work; and in time he will come to recognize a few of their wonderful qualities, and at the same time to confess that in order to compose *pictures* in the stricter sense of the word he will have to set about his work in a very different manner.

Of course, not even the most skilful photographer could ever hope to produce a picture equalling a group of Franz Hals in composition, truth to life, or interest; but it is surely unnecessary to produce those groups so constantly met with of persons resembling wax figures in their pose, and with the light and shade perfectly evenly distributed.

When we speak of the masses of light and shade, balance and unity, contrast and harmony of a landscape, we must remember that the functions of these must never be omitted in the arrangement of a group of figures.

The arrangement of form, line, and space can be manifold, but must always aim at a self-contained, pictorial appearance. It is just as dangerous to "stretch out" a group as it is to select a monotonous background. Let the figures be posed as close together as possible without crowding, taking care that the principal person be the center of interest pictorially, and let the tones emphasize the important points at the cost of the unimportant ones.

An old writer has the following prescription for the composition of a group: "Give the first place unto the king, the next unto his attendants or other persons of note; should there be present those of lesser worth, place them without more ado in the shadow." This advice must not, of course, be literally followed, "those of lesser worth" being liable to take offence if treated merely as so much background; but the idea is right in principle. Figures placed in the shadow need not be on that account unrecognizable, and in following the above advice the difficulty of a "restless" appearance in the picture is obviated.

Straight, hard lines should be avoided, as much as sharp corners, regular, repeating shapes, and parallel figures and actions.

A lifelike photograph should seldom represent a symmetrical appearance, for only in rare instances do these occur in nature.

Let us consider another popular method of photography than which nothing could be more objectionable.

In having to do with pictures of a very large size, "cutting out" and "pasting on" are frequently resorted to.

After a hasty sketch of the general arrangement the persons represented, as well as the accessories and the background, are photographed separately in a given position, size, and light, and the plates are enlarged and printed separately.

Then begins the work of the retoucher. He laboriously cuts out the picture with knife and scissors and pastes it on to the ground according to his sketch. The edge of the photograph will then be erased, corrected, or completed with pencil and brush and united as far as possible to the ground. Afterward, when the picture is framed and glazed, the deluded public will either not observe the cutting-out business, or in observing will admire the dexterity and neatness with which it is carried out.

In the reduced photograph the work of scissors and brush is less obvious, but the picture possesses even less clarity and interest. The price of such a photograph must be very high, otherwise it would not pay to do the work, and the method is pursued in every branch of modern photography.

Many a reader may say, "Why disparage this method? Have we not for years attained good results, earned any amount of money, and satisfied our public with it?" We answer by describing the effect given by one of these same productions, which came, by the way, from one of the best studios.

In spite of every effort made by the photographer the "cutting out" and "pasting on" was sufficiently obvious to even an unpractised eye, any depth of tone was lacking, and the perspective of the painted background was wholly false, as the figures in the foreground were as clear and sharply defined as those behind, besides which, one beheld retouched boots and drapery, forced highlights, etc., and yet the whole tone was gray and of an equal value all over.

Could not even this method be used with better effect? Yes, with regard to certain points, not with regard to all. Depth, perspective, and a natural effect must ever be lacking.

Money may be made, and a not too exacting and inartistic public may be pleased with the results of such a method, but a *good* photograph will never be attained by it.

It seems very necessary to do something to combat the one-sidedness and the limited range of treatment in present-day photography and as there is no means of learning, save by personal experience, we should use every available means of adding to our store. One of these means, demanding only diligence and a love of the art, is the hand camera. The study of typical or accidental appearances in nature by means of the hand camera is of the greatest importance both for groups and for single pictures. But how many photographers set to work in this manner? Most of them never bring their apparatus out of the studio; many of them look upon "snap-shotting" only as an amusement for amateurs. But is not the progress of many amateurs a proof that there are snap-shots and snap-shots, that instantaneous exposures can be made in an artistic spirit and can be of immense educational value? Thousands of opportunities are daily offered to the photographer of making studies of a charming pose, a quick, life-like action, and when he not only "snaps" but takes the opportunity of discriminating between the accidental and the characteristic, when he exerts himself to form of the scene a picturesque whole, and, finally, if he gives himself trouble over the careful finishing of the picture, even his studio work will derive benefit from the habit. Not only his technical powers, but also his powers of imagination will be strengthened, and he will find it easier to divide the natural from the unnatural. He will also keep further away from the set pose, which is always a forced and stiff arrangement.

Let us now run over the leading principles of group-taking. After receiving a commission to take a group find out first the number and character of persons. In many cases the studio may not afford sufficient accommodation, but the question *where* the exposure is to be made being of the greatest importance, the artist should make himself accurately acquainted with the locality. Let him carefully note the light and shade and the background, which will probably require altering. Then let him make a hasty sketch of the arrangement, which, however poor in execution, will be of the greatest service to him. Lines leading upward and outward should be looked for as giving life and action. After making this sketch pose the persons and strive to let them forget that they are about to be photographed (this will present some difficulty) and to look as if there were some meaning in their being thus assembled.

Then comes the critical moment of exposure, only to be rightly decided upon by the artistically educated photographer. It seems at first an impossibility, but even here practice will make perfect.

THE PERSPECTIVE AND VALUES OF A PHOTOGRAPHIC BUSINESS

THROUGH proper rendering of values and perspective in a picture or photograph we see things in their correct tone or shade, and get a suggestion of their relative distances. This sane faculty of distinction and discrimination, used in a different way, is also the main secret of commercial ability. The successful studio worker, who captures customers and currency, is he who fully understands, in addition to artistic and technical laws, the perspective and values of business.

As Cicero pointed out long ago, in "De Oratore," almost anything can be reduced to a science by analysis and classification, if only sufficient facts are available for sorting out. In the critical study of prosperous workers *versus* the failures certain outstanding points and features are sure to be noted, which may be boiled down and crystallized into aphorisms and laws.

We do not see things in their right depth if we undervalue capital, nor in their real perspective if we overlook time. Thus, a new photographic business should not light-heartedly be launched without enough spare cash in reserve to tide over an initial period of slackness, should it unexpectedly arise. It is the first six or nine months' waiting that breaks the unwary newcomer, who might have won through to permanent ease and comfort if he could have held out a trifle longer. A wise man always allows a margin. He has learned that though rugged obstacles seem dwarfed and softened when viewed from a distance, they are none the less present if they have perforce to be approached.

Then the values and perspective of locality. How nicely they need to be weighed; how futile to imagine that the same haphazard treatment will do for each and all! How the erstwhile West End portraitist flounders, like fish out of water, if he tries to work on the same lines in Stepney or in Burslem; how speedily comes disillusion to the "while-you-wait" artist who opens up in a "genteel" suburb! Of course, these are extremes, where there is little excuse for a mistake. Real finesse makes itself evident in the detection and appropriate handling of far subtler shades of difference.

Of very great moment is the capacity to gauge those gradual and almost imperceptible changes that localities are sure to undergo sooner or later and to adapt oneself thereto. It is quite common to find a once prosperous photographic business stranded and decadent, though doing quite as good work as ever, merely because it has failed to move with the shifting world around it, and to identify itself with local fluctuations. Old friends and clients remove or are lost and no new ones are made; competitors are suffered to create and cater for an altered taste without attempt at rivalry, there is no effort to keep up to date as to exterior, decorations, furniture, advertising; no endeavor to "go one better." Again, it is purely an omission to realize perspective and values—as they will appear to others.

False economy, an allied phase of tonal indiscrimination, is often found in those very directions where adequate outlay is most essential. It is especially foolish to be miserly over apparatus, materials, or display. Here, to spend wisely is emphatically the way to get.

A wrong perspective may be noted in two opposite and contradictory recipes often given for early arrival at a good bank balance. One is to see to everything yourself, the second to make others do all the work for you. Both are half-truths. Experience teaches that the way to distance competitors is by constant personal supervision, coupled with the delegation of details to well-selected competent subordinates. To separate the two things is destruction. The enthusiast of a "one-man" studio, unless a sought-out genius who can cammand his own prices, is either forced to admit that energy has limits, or gets a premature obituary notice.

"But," someone may object, "this is scarcely a matter of preference. The single-handed photographer probably dispenses with assistance simply because he cannot afford it." Precisely. But the fatuity of doing so is constantly and sadly obvious to all who have ears, eyes and brain. The ambitious one had far better remain an assistant for the major part of his life, till he can manage to start with at least a single helper—rather than embark "on his own" with inadequate capital.

Organization demands its own perspective and values. A wise employer will see that he has effective control, and is not a mere figurehead; that there is order, system, a deffnite place for everything; that work is rationally divided. He will take care that each detail of production and all overhead charged are "costed," and that the smallest order bears its due proportion, to show a sufficient percentage of profit. Nor will he forget that cheerful and healthy hands give the largest and best output.

The selective faculty needs exercise respecting prices and profits. It is asking for future trouble to underbid, and for present to profiteer. People expect definite charges, plainly stated, preferably without having to come inside to ascertain them. The studio where they suit the price to the sitter, or take mean advantages, soon goes to the dogs. The coupon and the free sitting are to be avoided. The public despise what seems to be at a discount, but flock in queues after what others fancy desirable. Two golden business rules are: Do not raise excessive expectations, so that a client may be agreeably surprised rather than disappointed; and never make promises that cannot be kept. A third is to suffer fools gladly, since a large proportion of inane chatter leads to orders. The really prosperous man knows how to talk—or, rather to listen.

The showcase or window ought to stop passers-by like a bullet. If they do not stay, the photographer will not either. Nor must its magnetism be allowed to deteriorate through lack of frequent change. While never forgetting that his photographs are not a necessary of life, the man who would sell them must do his level best to make everyone else forget it. The specimens should by no means be selected only from beauties or Apollos. It is sound policy to include a fair sprinkling of downright ugly people. Then those with but moderate looks—who form, in fact, the great majority—will not be frightened away, nor the severely practical repelled.

Not only to uphold the prestige of his craft—a consideration to which some are regrettably and imprudently indiffering—but because a flattering social valuation is one of the most essential ingredients of success, the photographer must endeavor to fill his due perspective by studying manners, culture, diction, dress in a non-fussy, sensible way, that will render him liked and respected by all whose opinion matters. Vulgarity and sloppiness do not pay nowadays, even where they might not unreasonably be expected to.

Taken as a whole, sitters are disgusted with "kow-towing," neither will they long tolerate one who acts as if conferring a favor. Both are ghastly mistakes from a business standpoint. How much recognition of the perspective and values of character is suggested in the Pauline method, "All things to all men!" Taken in the narrower commercial sense, it affords another key to prosperity, and its importance to the photographer especially cannot be overestimated. It implies an intelligent appraisal of others' likes and dislikes, fads and fancies; the accurate grading of humanity and femininity; the ability to humor and influence, with a sympathetic tact. Let the grumpy, unpolished, and unsocial abandon the vain attempt, or keep carefully out of contact with sitters, for their work in the studio or reception-room will be wasted!

As final advice, always be looking for something new, in styles, sizes, mounts, lighting, treatment. Constant production of "the same old thing" is almost as bad as never changing the showcase. Watch other business and professional men, not only photographers, and jot down items likely to be useful. Don't go by what they say, but what they do. Ponder most those points in which the successful agree, also those which characterize the failures. Sort, classify, and analyze. Be guided by the stream, but do not mistake a temporary puddle for it. Follow things to their consequences, deduce causes from effects. This is the genuine philosopher's stone of business success, for it leads to an infallible grasp of true values and perspective, helping one to put the unimportant and trivial in its own insignificant place and to devote attention to the things that really matter.—*British Journal.*

THOUGHTS ON STYLE

By F. C. TILNEY

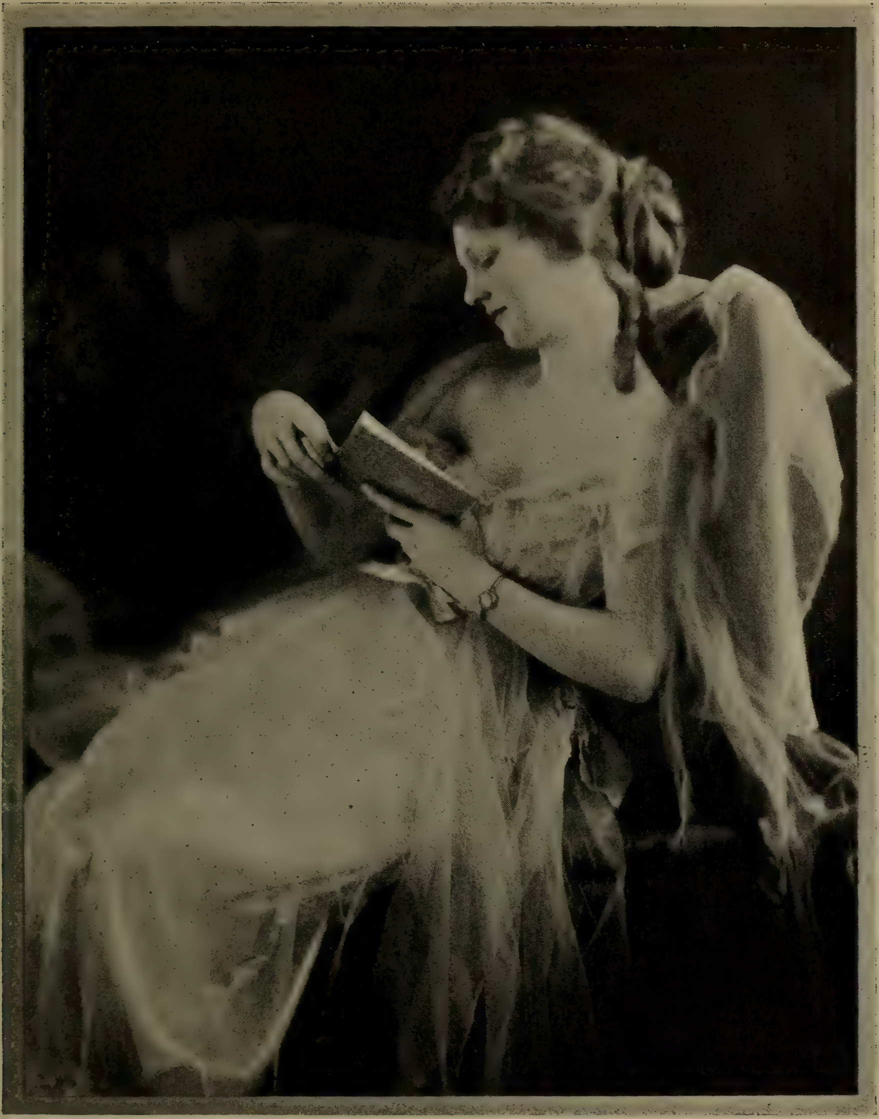
WHATEVER one may feel bold enough to say to the amateur pictorial photographer in the way of advice, to come before the professional portraitist in the role of mentor is not a part one volunteers to play.

It is a real truth—though naturally I try to hide it—that I am deluged with my own modesty before the man who can make a handsome living by taking likenesses. He has so much on his side already that I feel my opinions must be worth little or nothing to him. He has his experience, his own well-tried methods, and, as the outcome of these things, his routine. Why should I butt in? If he is a successful man, he will smile at my short cuts to artistic reputation: if he is unsuccessful, it is probably from causes which I could not touch.

Nevertheless I have been asked to meet him on the common ground of this charming little magazine. It is an honor that I do not wish to let pass. All the same, the blood, if there is any, be upon the head of the courteous editor. Certainly, it is not my first appearance in these pages; but it is the first time, I think, that I have deliberately set out to offer my goods in this particular market, already well-stocked with my particular commodity.

In the first place, then, is artistic portrait photography—or what is known by that name—possible and profitable?

There was a time not so many years since when a leading West End professional man confided to me that he had started his career in London in the sure and certain hope of taking the town by storm. He would show them! No more tickled-up conventionalities! He would give them something strong, virile, direct, beautiful. He started to do so, and in a few months found that it meant putting the shutters up. To keep things going he just had to fall in line and give old ladies beautiful



A STUDY IN HAND POSING
BY CHARLES H. DAVIS
NEW YORK

likenesses of themselves that would do for girls of nineteen. From that moment he prospered.

There is, however, a new spirit abroad today. How it has come into being, whether from the public or from the photographer, is difficult to say. My own opinion is that that rusher-in where others fear to tread; that irresponsible revolutionary, the amateur, who prances in utter obliviousness of damage over all the practices and conventions of the studio and dark-room; who underexposes, trims his prints in the dark, stains them with coffee, tea, cocoa, oxo or anything fluid within reach; who mounts them on waste-paper and gets an infant son to letter their margins—he, the mad amateur, has upon occasion stumbled upon some bright ideas. If a man lets himself go enough, he will be sure to make a pleasing fluke or two.

In the course of time the amateur's vagaries have been taken in hand, treated with taste, skill and judgment, and finally have been laid as the foundation of a new style. In many cases the amateur himself has stepped off his privileged ground and opened shop. It cannot be denied that his influence has remodelled the old order of things. Would these highly revered firms who boast of the most select connections, and sport the royal arms, ever have developed so far upon their own initiative as to produce, even as a side line for show or gallery exhibition, the audacious things that bear the single trade-mark sort of name of two or three firms flourishing today?

There is something excitingly fresh, irresistibly compelling, in the latest output of a few of the studios which undoubtedly owes its origin to the amateur's absurdities. How did it come about?

To my mind the case can be put in this way: The amateur works for kudos, not for cash. He does a thing in a devil-may-care sort of way and has no anxiety of the consequences. He cannot lose the order, because there is no order to lose. If the sitter of whom he is making gratuitous studies doesn't like the result enough to take it, he can leave it, and no harm is done. But the professional cannot enjoy himself in this way. When he works it is for a customer who has already pulled over all the specimens in the showroom and has finally decided upon having something "like that." If it isn't like "that" the print may be thrown back on the photographer's hands, together with all the work it has involved. It is there that the professional finds that it does not pay to experiment; and he, in his commercial wisdom, goes on doing the safe thing, with the slowest possible changes in style tentatively creeping in.

Further, those very changes are for the most part but changes of treatment in the processes after exposure. The amateur's "eye-peelers" were the result of monkeying with the camera and the sitter too.

The question presents itself whether it is not possible for the professional man to take this pioneer work out of the hands of the amateur and commence to educate his public himself. The times are vastly changed since the day of the sanguine West-Ender of whom I spoke. The art of painting has gone so hopelessly mad that people are now, almost to a man, firm in the belief that a thing that looks unlike anything that ever was done before is probably the thing to possess, since it implies a highly cultured exclusiveness in its possessor. This doubtful tendency on the part of the public at any rate opens a door to novelty of idea in the photographic studio. It does not follow that the new must always be bad. Nothing is bad that has Nature behind it. With a camera one is always holding the hand of Nature. All that is wanted is a change of the old conditions.

The greatest latitude is ever with the most artistic worker. A thousand and one ways of doing arresting work that is good art remain yet untried. The public are panting for them. They are possible and they will prove profitable.

My readers will probably say, "Go ahead! What are they?"

It will be a pleasure for me in succeeding issues to make a few suggestions that may help to answer that question. At present I can do no more than raise the notion for individual consideration.

It should be stated here, however, that any development of ideas in these pages will take a line along the solid ground of Nature and sound art principles. Those principles, being as they are the response in our minds to our natural experiences, are safe in the hands of photography as long as mere trick is avoided. We must be careful that in the part of the procedure where the camera is not concerned, as in posing, lighting, design and so forth, the sound principles of art are not violated, because if they are the efforts will be futile.

To go in opposition to our experiences of Nature is, *ipso facto*, to produce the thing which everybody recognizes as absurd. It is often done, but never with impunity. The Art that gives the lie to Nature or even that represents Nature in a way different from usual human experience can never have a wide appeal. — *Professional Photographer.*

SOME CONSIDERATIONS OF STRAIGHT PHOTOGRAPHY AND CONTROL

BY ANTHONY GUEST

A GOOD deal of attention has lately been directed to "straight" photography. Its zealous advocacy has tended to set up a state of rivalry between this method and the processes of "control." If the one is right the other must be wrong, is apparently the view of some controversialists, who do not seem to have considered that there may be room for both; still less, to have endeavored to determine the proper function of each.

It is unnecessary here to refer to the many directions in which the camera's "plain unvarnished tale" is of the utmost value for military, scientific, and industrial purposes. Pure photography has here a wide field entirely to itself as the unrivalled discoverer of and witness to facts, sometimes microscopic and unsuspected, and in some cases disputed until the point at issue is finally decided by such unbiassed evidence as that of the camera picture.

But the present question concerns the artistic development of photography, and it is only in this comparatively limited sphere that "control" has its chance. Even the crudest fake may be credited with an artistic aim, so long as it is not perpetrated with intention to falsify the truth. It implies an effort, however futile, to enhance the beauty of the print, generally through selection and coincident suppression, which are indispensable to artistic expression; and there are those who do not see why these resources should not be at the disposal of the artistic photographer. But he is sometimes deterred by the objection that such practices bring about perversion of fact.

The "straight" photographer also claims to produce artistic results. He employs selection in the choice of his scene and in the choice of his moment, but these are responsibilities that all photographers must inevitably undertake. Once the exposure is made by the apostle of "straightness," there is no more selection, and nothing is suppressed. Only the pure statement of the camera, it is held, can give the real rendering of fact.

The ideal of the photographic purist, therefore, is the perfect print representing the genuine impression received and recorded by a perfect instrument. So he carries out the excellent artistic principle of devotion to, and faith in, the medium with unsurpassed thoroughness.

The question is whether he does not carry it too far, and whether such unlimited confidence in the instrument may not lead to its becoming the master instead of the servant. Still, the adherents of this kind of work often send examples to the exhibitions of such high technical excellence, and so attractive in subject, that they win a good deal of admiration and many followers. They are the exponents of the possibilities, and inevitably, also, of the limitations of one phase of photography.

To many admirers these limitations are not apparent; indeed, their existence is not always admitted even by the workers themselves. The fact is that there are more people who can pick out a false note in music than in the tone-values of a picture; but, even so, the conductor of an orchestra detects many an error that is unnoticed by the audience.

The camera, with all its merits, cannot be completely relied on for truth of tone, and therefore those whose perception is sensitiveness to its faults claim the right to correct them by means of "control." This does not seem any more unreasonable than to require that a piano should be tuned on occasion arising. Tone means much; it conveys the inner significance or spirit of a scene, light and atmosphere, emphasis and distance, and the intangible elements that constitute feeling, poetry, and life. Due relationship of its gradations confers a sense of distinction on pictorial work.

To those who regard photography as something more than a record of accumulated facts, as, in fact, a medium for expression of what the artist individually feels and sees, personal control for the correction and harmonizing of tone is an essential factor. Without it photography might reach the zenith of craftsmanship; but the artist would have to seek a more flexible and responsive medium, whereby selection and suppression—the means of accentuating the idea as distinguished from the facts—would be available not merely for choice of place and time, but for application throughout the design.

The importance that some photographers attach to facts implies a misapprehension of their significance, and a failure to distinguish between fact and truth. Fact is not truth. Truth is a synthesis of many facts, ordered and considered in relationship one to another. A fact as recorded by the camera may be beautiful in itself, but it may also be a contradiction of the fundamental truth. Also, a fact, unless adjusted to its proper pictorial value, will certainly exercise a disturbing influence on the composition.

There is another potent reason why the uncontrolled print cannot be relied on for a record true to human apprehension—to say nothing of the trained vision of the artist. The camera has a single eye; the man, having two, receives his impressions from different angles. It might be thought that the slight divergence of these two points of view would make only a negligible difference, and probably, for the common purposes of life, this is true. But the artistic difference, if subtle, is by no means unimportant, as anyone may convince himself by a simple test. Look at an object some twenty-five feet away, first with one eye, then with the other—an upright stick, or perhaps one of the uprights of a window frame would serve the purpose—and it will at once be noticed that the object under this alternating vision appears to change its position in relation to the details beyond. Moreover, the shadow side of the object, seen clearly and sharply with one eye, will almost disappear, and the lighter side be emphasized, when seen with the other. Hence, the single vision commits the observer to a definite and uncompromising picture that contrasts with the softened and more poetic impression resulting from the two angles of sight with which nature has endowed us. Nature is always working for beauty and here is a proof that while providing beautiful scenes and things for the elevation and refinement of a not too appreciative human race, she ensures that they shall be seen in a beautiful way.

In dealing with portraiture and expression, the difference between single and double vision is especially significant for the sharper and more fixed rendering of the single eye lacks the sympathetic quality of a less uncompromising vision that imparts a sense of life to the human face. But whatever the subject, the double vision reveals a delicate play of light that tends to eliminate hard outlines and to introduce the appearance of animation to vitalize and augment beauty.

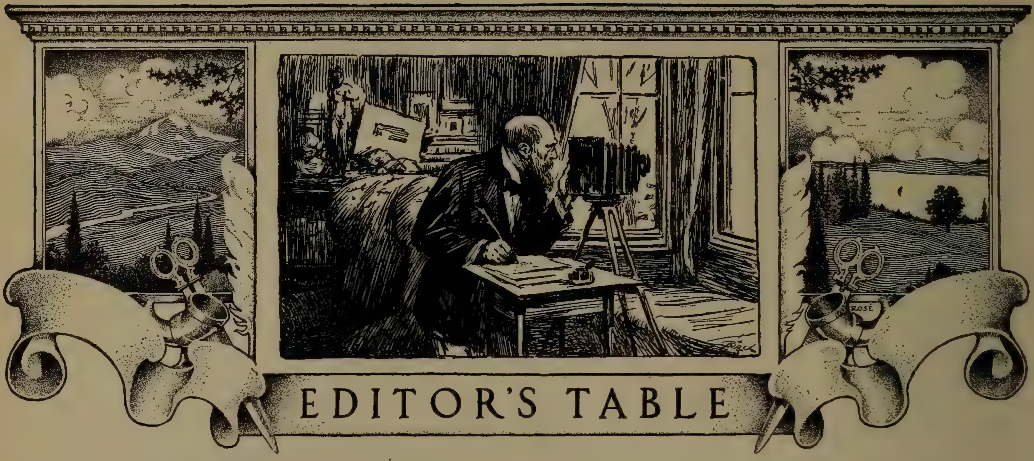
A no less important consideration in comparing human vision with the single eye of the camera is that in one case the image is reflected on and inevitably modified by an intelligence, while in the other there is no such discriminating, selective, or idealizing influence. If art is nature seen through a temperament, the artist-photographer cannot be content with such an uninspired record as that to which the instrument, though skilfully guided as to length and moment of exposure and helped out by perfected technical conditions, must still be limited.

So there is much to be said for such modification or control as will correct faults and add something of the individual preferences, temperament, and feeling that make up the human impression.

The more vivid and compelling these influences are to the worker, the less will he be satisfied by pure photography as at present understood. But if the photographer is one of the many who are sensitive to natural beauty in a general way, but have not troubled about the artistic principles that inform discrimination and have not sought the subtle elements of the spirit and poetry of a scene, the "straight" print, which approximates dangerously to reality, may well afford an acceptable souvenir. It may also be educative, for familiarity should in time open the owner's eyes to the absence of the essential something —his own emotional delight in and communion with the life and beauty of nature—and if he is keen enough to seek an explanation of the deficiency he will be on the way to progress.

In skilful hands "straight" photography can yield beautiful examples of technic, eliminating some inherent defects of the medium and producing a surface that in itself is pleasant to look upon. The prints at their best are so insidiously clever that shortcomings are unnoticed by an uncritical public, who are liberal in their praise of fine results of the uudoubted skill devoted to the work, and do not demand "the little more." After all, the "straight" print serves to glorify photography rather than to express the individual or to do homage to nature and art.

"Straight" photography represents the craftsman's ideal, and so far it serves a useful purpose. It may do much more; it may, indeed, be the most important factor in photographic progress. The artist-photographer must be a craftsman before he can express himself, and it is most desirable that he should do so as far as possible by pure photography. Though I doubt whether this can ever be fully accomplished without some methods of "control," it must be evident that all the efforts that are being made to raise the "straight" print to an artistic standard must tend in the long run so to increase the flexibility and power of the medium as to bring it nearer the artist's requirements. If these efforts are continued the need for "control" will probably in time become diminished, so that "straight" and "controlled" photography may perhaps one day be brought so near together that they may shake hands across the dividing line.—*Amateur Photographer.*



EDITOR'S TABLE

TO OUR READERS

IT has been our pride for years not only to maintain the high standard and quality of this magazine, but to give our readers a large and generous source of valuable and helpful information. Now we are seriously confronted with a stringency in the paper market in this country which is fast becoming acute. It is quite impossible to obtain certain qualities and quantities of paper and the publisher is compelled to accept only what he can get. Thus it is that our readers will notice a slight change in the paper we are now using. But the situation is not permanent—conditions are sure to right themselves. In the meantime we ask the kind indulgence of our readers and friends, and we will make every effort to spread a more serviceable monthly feast, even though our "dress" is not of the best material.

POSING MEN

THE average man is not a satisfactory object for the photographer's art. Perhaps this is largely because we have not studied our male sitters with the same close thought and attention which we bestow on our lady customers. In the latter case we have often great assistance in the clothing of the subject; and our greatest help is the natural inclination of a woman to endeavor to look her best at all times. The man depends for his appearance, on a few stock lines, clean linen and boots, a shave, and clothes well brushed or pressed.

When the man enters a studio there is often—though perhaps unconsciously—a feeling of restraint. How many men nervously stroke their hair back or endeavor to adjust their collars. The man is in fact reverting to the time when he suffered under the Sunday scrub and hair-brushing, that never-to-be-liked *interim* when romping was forbidden and decorum reigned supreme. The woman in entering the studio is only experiencing the sensation which she feels daily when she dresses for the evening or titivates before the glass. The first thing, therefore, that the man does when he is posed is to hold his breath and refrain from winking; in short, to become uncomfortably self-conscious. And the most the photographer can get is a mere map. The man is suited with the picture, perhaps, and his family think it is lovely and "slicked up," but still they keep a miserable little snap-shot, underexposed and badly printed, which has more of the life of the man, because the man thought it was fun to be taken, and grinned at the camera. *Give the man something to do.* In many a case the man is squared up for the ordeal, and he is resolutely gazing at some mark on the wall.

Do not magine that because you have placed your sitter in a back corner of the operating room, where only a few stray rays of light can reach him, that you are practising art principles. Do not think that the use of any so-called system of lighting is going to make you artistic. These things are all right in their way, but are mere trifles compared to the art knowledge that must be back of them in order to make any intelligent use of them. You can make no worse mistake than to copy others. Practice effects, but be sure your method of illumination is helping tell your story. To exhibit all your efforts and insist that they are the proper thing will only demoralize your business and give you a false idea of your own abilities. We think one of the prevailing errors of those who attempt the so-called artistic effects is that they are impressed by a certain style of lighting, and in order to get as far away as possible from what they have been doing they exaggerate that effect. We do not believe that ruggedness is the chief virtue of art, and do not believe in the bald statement that art is truth. Art can have no higher aim than a dissemination of a love for the beautiful. If you will remember that the human head is a ball, and to retain that rotundity the further portion should be in deeper shadow than the nearer, you have learned one lesson of art. If you will remember that one of the essentials of a picture is to tell its story, you will have learned another lesson. *Educate yourself and you will educate the public.*

To educate is, indeed, the key of the situation. It is the man who trains himself who improves. "I fear my work won't quite please you," wrote a subscriber recently, "because I keep trying new lines, and am sometimes a little shaky on them." The man who is trying new lines is educating himself, and his distrust of his work is evidence that he is improving in it.

PRACTICAL PAPERS ON STUDIO WORK AND METHODS

Daylight Where You Need It

By A. J. Cunningham

There isn't another profession or business in which so many things are used, which were never made for that use, as in photography. This is especially true of commercial work. It seems that almost everything made has its use somewhere in the making of photographs; from the children's modelling clay, or Plasticine, to the sugar which was found to be a component of some of the war-time metol substitutes.

One of the handiest of these articles, and one which is particularly adaptable to our efforts to make "better pictures," I have found to be the garage lamp.

In the average printing-room, lighted with orange or yellow light, no provision is made for examining prints by daylight or its equivalent. We know from experience that it is impossible to judge the true tone of a print by this yellow light Of course you may know that when a print has a certain appearance under the yellow light it will be correct by daylight, but this is an inaccurate method at best and is bound to produce a variation in results.

On the other hand, it is common practice to take a print, or a few of them, to a window, where they may be examined by daylight, and of course this gives the desired result; but the window may be quite a number of steps from your hypo tray, and there is a loss of time as well as energy. In the end you no doubt give it up and take a chance on your judgment under the yellow light.

It is just here that the garage lamp saves time, energy and paper. The one which I have in use and which has given me such wonderful satisfaction that I must pass it on, is an ordinary, portable lamp, as shown in Fig. 1, and which is obtainable from any dealer in auto supplies. It consists of a socket on a handle, to which is attached a wire shade or protector, and is fitted with about twelve feet of flexible lamp-cord. There is a plug on the other end of the cord, which may be screwed into any convenient light-socket.

A suitable shade must be made to prevent the rays of light from striking anywhere except directly in front, like an ordinary flash-light on a large scale. The best material for this is the black paper which comes around your paper. It is tough and fairly repellent to moisture. A metal shade might be made, but it will quickly rust unless properly protected and must be replaced, and although the paper one will need replacing, it costs nothing and it takes about five minutes to make.

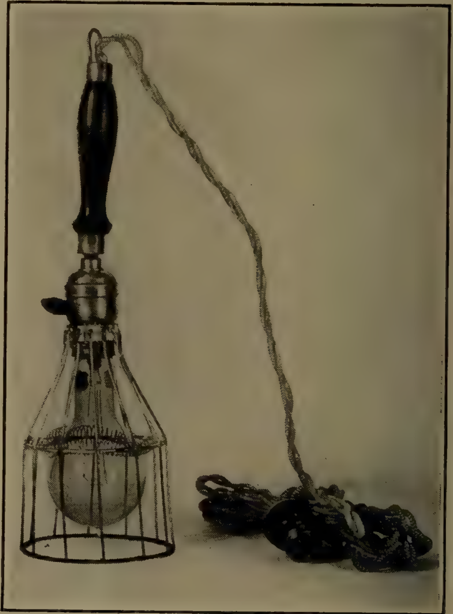


FIG. 1

First, cut a piece of black paper about 2½ inches wider than the depth of the wire frame and long enough to go around it with an inch and a half to overlap. Bring this around the base of the wire frame, leaving the two and one half inches extending below the frame. It may be held in place with a piece of cord, or, better still, with a piece of gummed tape such as is used to seal packages. It comes in rolls and is very handy about the workrooms. Adhesive tape answers well but is not so permanent. Next, by folding in at a few places, the paper may be fitted around the top where the frame tapers to the socket, and again held in place with a piece of cord or tape. Now tuck the two inches, which extend at the bottom, inside the frame, and finish up by putting a band of the adhesive paper around the bottom, as shown in Fig. 2, to strengthen the whole and protect the edge.

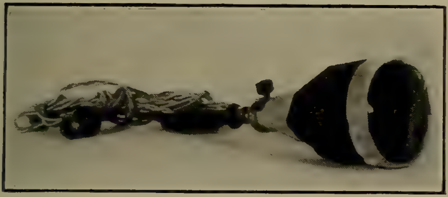


FIG. 2

For a bulb use a Mazda "C" lamp of 75 watt. This is the blue nitrogen globe.

This lamp gives the closest visual effect of daylight, which is, of course, of the utmost importance. With it you can detect the slightest variation in tone as well as any turning of the whites. This is invaluable to the kodak finisher or commercial photographer, when finishing large numbers of prints, to detect discolored margins due to forcing or old developer.

Fig. 1 shows the lamp complete. You will note that the bulb does not extend quite to the bottom of the shade. This causes the light to be thrown straight in front of the shade and eliminates any danger of fogging paper by stray light. Have the lamp standing or hanging beside your hypo tray, and it is a simple matter to look at any or all prints by merely turning on the light and directing it straight down on the tray. In fact, you may point it anywhere except directly at your paper with no danger of fogging.

Its uses are manifold and a short trial will make it a very valuable part of your equipment. The expense is light and it is bound to mean prints of a more uniform quality without the slightest trouble. Use it. It is a handy weapon in your campaign for "better prints."

Commercial Specimens

THERE are many photographers quite capable of turning out good technical and commercial work who fail to secure orders in this department for want of a little business knowledge or method. As a rule the display of specimen photographs is poor, not perhaps in quality but in variety and in the way they are shown. As a rule manufacturers are in the habit of dealing with skilled travelers or agents who make a point of presenting samples and sometimes photographs of their wares in the most attractive way possible, and they hardly know what to expect of a man who shows a few dog's-eared prints of various subjects, none of which are, perhaps, quite what they require, and who is rather uncertain as to the prices he is willing to accept. To obviate this state of things the photographer must put in a little time making negatives for specimen purposes only, and be prepared to give a few prints in return for the loan of originals, if needed. In many towns if a photographer is a good neighbor he can borrow china, glass, plated ware and the like without any trouble, while at the local garage the proprietor will usually be glad to run out a car or two in return for a print. And the caterer for the manufacturer or the merchant must consistently keep in mind that photographs are required on account of their merits in selling goods; their technical qualities, while they must be of a high order, must also be applied to this end.—*B. J.*

Studio Decoration

THIS spring will probably see quite an unusual amount of furnishing and re-decorating of studio premises. The high cost of materials and labor will doubtless prove deterrent in some cases, but where the principal or his most valued helpers have been away for four or five years there has not been much opportunity to keep things spick and span, and the time has come when re-decoration can no longer be delayed.

Before setting out on any scheme, it is advisable to give a little consideration as to the color of the walls of the studio, as it is sometimes possible to effect a considerable improvement in the work by adopting a lighter or darker color than the existing one. As a general rule, it will be found that a studio on which direct sunlight falls during part of the day may have with advantage the walls of a darker tint than one with an absolutely northern aspect. The color, apart from its depth, should also be chosen with due regard to the aspects, as it is easy to make a studio appear too hot or too cold by injudicious coloring of the walls. For example, we have seen a sunlit studio in which there was a dull red dado, the walls above being warm buff, while the floor covering was red buff and black. Such an arrangement cannot fail to give an impression of heat when a sitter enters on a summer's day. In the winter it may look cosy, but it is much easier to create an impression of warmth in winter than coolness in hot weather. For the latter, cool grays or greens should be used, the depth of tone being regulated by the amount of light in the studio; a strongly-lighted apartment calls for darker walls than one which is more shut in by surrounding buildings. It is, however, open to question whether the studio walls should be considered as playing any part in the lighting of the sitter, or whether such reflected light as may be needed should not be provided by proper reflecting screens.

Oak panelling, real or the Anaglypta imitation, makes an excellent lining for a studio, and occasionally comes in well as a background. It is best when finished in a fairly dark color, the warmth or coolness of the room being suggested by either reddish or buff walls above the wainscot for warm effects and green or pale gray for cool ones.

If the expense of panelling be objected to, an excellent effect may be produced by using art canvas or Arras cloth divided into panels by strips of wood, which may be painted or stained at discretion. Distemper should not be used except on the ground of cheapness, as it rapidly becomes shabby by having furniture and accessories pushed against it, while finger-marks or other stains cannot be washed off.

As a rule, such part of the ceiling or roof as is not covered with glass may safely be whitened, as, from its position, it will provide a certain amount of reflected light, without causing flatness. The sash-bars and any frames round the glass should also be white or pale gray, that they may reflect as much light as possible. When festoon curtains are fitted, the color of the dark ones should be made to agree with the general scheme, either matching or forming an agreeable contrast. Thus, with oak walls, the blinds may either be brown or green, the aim being to avoid using too many colors; black is usually considered as too heavy in effect for curtains. When color relief is needed, a hint may be taken from the artistic housewife who makes use of patches of decided color in the form of cushions, and these may also be turned to account in posing.

When re-decorating, the furniture should not be overlooked. Anything which is obsolete or damaged beyond the possibility of repair should be removed and the remainder put in good order. If one or two new articles can be added, so much the better, but, as a rule, studios are overcrowded, and a little weeding-out will be all to the good. The camera and stand often form an eyesore in an otherwise dainty studio, for many excellent instruments were designed without any other idea than usefulness, and when they have lost their original color and received a few bruises they look rather hopeless. In such a case we have seen an excellent effect produced by thoroughly cleaning the woodwork, sand-papering down any roughness, and giving two thin coats of black Ripolin, which converted rather a piebald combination into a respectable black one, a new focussing-cloth of moss-green plush completing the transformation.

Backgrounds, diffusers, and reflectors also need overhauling. Scenic grounds are rarely used nowadays, and those which are on the retired list should be given a coat of plain distemper. Black, white and medium gray are useful, in addition to any graduated or scenic grounds which may already be in use. The metal frames of diffusers, reflectors, and the whole of the headrests are best painted a medium gray.

We would emphasise the necessity for giving as much attention to the contents of the studio as to the structure itself, for nothing can look worse than a lot of shabby furniture displayed against newly-decorated walls.—*B. J.*

At-Home Portraiture

THE speed with which one can travel long distances by motor-bicycle, and the fact that the latter can be bought on the hire-purchase system, have enabled many practitioners of more or less ability to invade the preserves of the country and suburban professional and gather the choicest fruits. There is also the top-hatted and frock-coated interviewer from the metropolis with his train of skilled operators to be reckoned with, and it behoves the country professional to see to it that his work is unsurpassed by either. The multiple-shop companies, possessing factories for printing and finishing, thereby securing the benefits of uniformly good quality that can only be obtained by employing specialists in each department, fairly compel him to turn out to seek fresh customers, and unless he can offer something different at a moderate price he will be well advised to apply himself to at-home portraiture and commercial work. It is a branch of the profession having the advantage of not being a season trade, there being an abundance of work both in winter and summer to be had for the asking.

Now, to become a successful "at-home" photographer, one whose work is distinctive, artistic, and pleasing, it is necessary, besides being master of the craft, that you possess artistic ability, initiative, tact, and are fond of children and animals, and unlimited patience and good temper are absolutely essential. If you are deficient in the above, secure as your assistant one who "fills the bill."

For this class of work it is essential to have a conveyance of some description. Going by train is both expensive and inconvenient, often an impossibility. Choice rests between a pony and trap or a small two-seated motor-car. One of the latter with a small van built at the back would be the most useful.

Your equipment must include lenses to meet every contingency. Views of the house may be required, which may necessitate either a wide angle or a telephoto lens. Portraits of children playing on the lawn will require one of 7 or 8-in. focus, but for portraiture a lens of at least 13-in. focus is necessary. A three-times color screen should be included in the outfit and ortho plates placed into the dark slides.

Telephoto lenses, and sometimes the front or back combination of a rectilinear, prove useful when visiting a mansion that has a pleasing aspect when seen from a distance. It may be placed among trees with a pleasing background of hill and sky—a composition entirely lost at close quarters, for a wide angle lens cannot show what lies behind the house. A successful picture of this description is sure to please your client and enhance your reputation. The 8-in. lens is useful for views of gardens and genre work, as it has a fair depth of focus at open aperture. It is also useful for portraiture in small rooms, but the 12-in. or even longer focus lens should be used, both in and outdoor, when circumstances permit.

When making views of the gardens every effort should be made to secure pictures that will please. As you are aware, your client has been seeing a sort of composite picture in the view he wishes you to take, and unless you carefully consider what the result will be you may only get a merely illustrated ground plan, with a poor order for your pains.

Always aim to show a motive for the picture; emphasize something. If the view selected is made up of a number of small beds, which as the eye wanders from one to another give sone a beautiful composite impression of the whole, the camera will but give you the aforementioned uninteresting ground plan. Rather approach more nearly one section, so that it dominates the composition and suggests what the rest looks like. But if your client insists on the ground plan, persuade him either to be in the picture himself or put one or two members of his family into the composition. It will put it together somewhat. The same applies to lawns bordered with trees; unless you can get a foreground or middle distance study, the pictures will be flat and uninteresting. If it can be managed, greenhouses and conservatories must receive similar treatment. You will generally find the gardener, when he knows your wants, only too willing to stage the plants to the best advantage for photographing. Footpaths through flowering banks and borders must be so managed that the gravel-path does not come out as the most prominent part of the picture. The wealth of bloom is the motive of the picture, and be sure the most prominent plants are so carefully focussed as to give the keynote of the whole scheme. Should the lighting prove unpropitious for what would otherwise make a good picture, a second visit at a more suitable time should be made.

Garden portraits well executed are very pleasing; but the picture that gives the most pleasure is one that portrays a rather small image of the sitter, taken in a carefully selected part of the grounds, and giving the impression of being the work of a clever amateur with an appreciation of pictorial composition.

Indoor portraiture will tax the operator's craftsmanship to the utmost. He will rarely find two rooms alike. Take two rooms both alike in size and shape; in the one two seconds may be ample exposure for the subject; yet in the other seven to ten seconds may be necessary for the same subject, the reason being either that interior decorations are of sombre hue or light precluded by near trees or buildings outside. Some writers recommend exposure meters, but an operator gravely watching for the tints darkening in a poor light is apt to give the sitter a bad attack of nerves. The quickest and best method is to use a calculator, which demands that you use your judgment on the environment and weather, and then you will not be nonplussed should the light suddenly change and grow brighter or dull. But whatever the means adopted, err slightly on the overexposed side.

I have worked in rooms where reflectors have been quite unnecessary. In others it has been necessary to use a full-sized sheet, to which I have pinned pieces of brown paper to parts requiring such suppression.

It is a good plan to pose either your assistant or one of the maids, and after focussing to request your sitter to imitate the proxy—a mode of procedure that tires no one and accelerates the sitting.

Garden scenes printed in carbon, full advantage being taken of the range of colors this process offers, will, if good negatives have been made, considerably enhance your reputation and lead to further business. Do not let bromide paper be your only medium simply because it is capable of allowing large quantities to be got through quickly. It is this ease of production that brings all this competition about your ears.—J. H. ROBERTSHAW in *B. J.*

ABSTRACTS AND TRANSLATIONS

BY E. J. WALL, F.R.P.S.

Sensitizing Carbon Tissue

NAMIAS, of Milan, points out that the neutral chromates give a much less sensitive carbon tissue than the bichromates, and that the addition of an alkaline caustic or carbonate to a solution of a chromate completely destroys the sensitizing. It is well known that the spontaneous insolubilization of the tissue runs *pari passu* with the sensitiveness; therefore, Namias argues that tissue sensitized with alkaline chromates will keep indefinitely, which (if true) will enable us to store chromated tissue for any length of time, and to render the same sensitive again, one has merely to expose it to the fumes of a volatile acid, like acetic, to confer sensitiveness on it. This fuming may be done by hanging the tissue in a box at the bottom of which is a dish containing some acetic acid.—*Il Prog. Foto.*, 1915, *p.* 208.

Collodion Films

M. CHARDONNET, so well known as the manufacturer of artificial cellulosic silks, stated before the French Physical Society that the addition to a collodion of an alkaloid, such as quinine or brucine, or aniline, in the ratio of one three-thousandth of the weight of the dry nitro-cellulose, considerably increased the elasticity without affecting its strength.

He also stated that the thickness of a collodion film is practically proportional to the cube of the concentration in nitro-cellulose of the collodion used. If, for example, a collodion, containing 10 per cent. of nitro-cellulose gave a film weighing 25 g. per square meter, then, under similar conditions, a collodion containing 200 g. per liter would give a film weighing 200 g. per square meter as $25 \times 2^3 = 25 \times 8 = 200$.—*Phot. Rev.*, 1919, *p.* 156.

Plate Sensitizing

Von Huebl again deals with the sensitizing of plates by bathing, and in this particular case treats of the addition of ammonia and alcohol to the sensitizing bath.

The addition of alcohol to the sensitizing bath is defended primarily on the ground that it produces rapid drying; for rapid drying is very important, as plates which take some hours in this process are always foggy and flat working. For this reason he recommends the addition of from 20 to 30 per cent. of alcohol to the sensitizing bath.

An alternative to this is the use of alcohol as a rinsing bath; that is to say, after bathing the plates in the usual manner for about three minutes, in an aqueous solution, the plates may be immersed for about a minute, with continuous rocking, in a bath of 90 per cent. alcohol.

The secondary purpose of the alcohol is to keep the dyes in solution, and this von Huebl states to be absolutely essential with some of the isocyanins. He points out that the dyes are in a colloidal state in water, and advances as proof that by passing such solutions through a filter paper most of the dye will be retained on the fiber of the paper or on the sides of the vessels. And the solutions behave in the same way with a gelatin plate, and the dye separates out to a great extent on the surface of the gelatin, and gives rise in developing to fog, spots and wave marks, and it is obvious that, if the dye is thus superficially deposited on the gelatin, the solution that does penetrate must produce lower color sensitizing because of its loss of dye.

The alcohol-containing solutions are, on the other hand, true solutions, which can be filtered and are much more suitable for color sensitizing. But the addition of alcohol must not be too great, as otherwise the sensitiveness suffers.

In order to prove this point, a series of plates were bathed in a solution of pinachrome, with various additions of alcohol, with the following results:

50 per cent. of alcohol . . v = 7
25 " " . . v = 23
10 " " . . v = 23
No alcohol . . . . v = 26

Similar results are obtained with ethyl red, pinaverdol and pinachrome violet, which dyes have a slight tendency to flock out.

It is entirely different with pinacyanol for this gave:

25 per cent. of alcohol . . v = 33
No alcohol . . . . v = 12

With pinachrome blue the figures were:

25 per cent. of alcohol . . v = 12
50 " " . . v = 33
No alcohol . . . . v = 7

With pinacyanol blue:

50 per cent. of alcohol . . v = 33
No alcohol . . . . v = 3

To test the action of a secondary alcohol bath the following figures were obtained:

Orthochrome aqueous bath . v = 30
Ditto with alcohol bath . . v = 29

With pinacyanol the results were:

30 per cent. alcohol . . . v = 36
No alcohol with alcohol rinse . v = 14

With erythrosin the addition of alcohol, whether added to the bath or as a subsequent rinse, was decidedly prejudicial, the sensitiveness being much lowered.

As regards the addition of ammonia, von Huebl points out that it is quite a common belief that many dyes will not sensitize without ammonia; but Koenig has pointed out that, as a rule, it is quite superfluous, and in any considerable quantities is really prejudicial, as it causes fog to rapidly ensue. The isocyanins are extremely sensitive to acids, and therefore, to prevent the effect of acid, about one or two drops of ammonia to 100 c.c. of bath is permissible.

The following figures prove the poor action of ammonia; in the case of orthochrome:

Without ammonia . . . . v = 30
With " . . . . v = 33

For pinaverdol:

Without ammonia . . . . v = 32
With " . . . . v = 26

For pinacyanol:

30 per cent. alcohol without ammonia . . . . v = 33
30 per cent. alcohol with ammonia . . . . v = 32

Instead of ammonia it is far better to add a little borax, about 1 c.c. of a cold saturated solution to 100 c.c. of the bath. This will neutralize any acidity and yet does not induce subsequent fog. In the case of erythrosin, however, ammonia is superior to borax—*Phot. Chron.*, 1920, *p.* 41.

Namias states that when using such sensitizers as pinachrom or pinacyanol it is extremely difficult to prevent fog, and advises the addition of 0.1 to 0.2 per cent. of boric acid to the sensitizing bath, which, he states, stabilizes the dye and prevents fog, without affecting the color sensitiveness, although the general sensitiveness is slightly lowered.—*Il Prog. Fot.*, 1916, *p.* 40.

Von Huebl's measurements are based on a particular sensitometric method, about which I know nothing, as his description of the same appeared during the war; but he does state, in a footnote, that they were made to an artificial daylight source and that the unit is the sensitiveness to wave-length 495 in the blue, and that his figures given above represent how much the sensitiveness at that point must be lowered. I have multiplied his unit by 100, to save fractions, and therefore the above figures represent the fraction of the sensitiveness to his white light taken as 100. Von Huebl further states that a variation of 25 per cent. in the figures is of no moment.

Sheppard, in a very exhaustive paper (*Phot. Journ.*, 1908, *p.* 300) proves that alcohol has a marked effect in lowering the sensitiveness even with pinacyanol, and, as his curves are based on very close wave-length measurements, one would feel inclined to lay the greater weight on them.

With reference to the "flocking-out" of the isocyanins and their absorption by filter paper, it should be pointed out that it has long been known that these dyes only formed true solutions in alcoholic menstrua, and also, being basic dyes, they would naturally be taken up by filter paper, as all basic dyes have a strong affinity for cellulose, while acid dyes have practically none but a great affinity for gelatin.

With reference to Namias' note, it is a little difficult to reconcile with facts. From actual trial I have found that boric acid readily decolorizes both pinachrome and pinacyanol, and, while Koenig has stated that these dyes when decolorized are equally good color sensitizers, this does not jibe with my experience.—*E. J. W.*

A Bromoil Tip

Dr. Emil Mayer, the president of the Vienna Amateur Photographic Club and the author of a book on the bromoil process, suggests that the most artistic results in photography are obtainable by breaking up the image into points, so as to obliterate obtrusive detail to some extent, and that soft-focus lenses, chiffon, bolting silk, *et hoc genus omne*, have been used. In the bromoil process these effects can be obtained by the expert by the brush alone—when once applied—but that a second or more applications spoil the results.

He has now discovered that the desired result can be obtained by spraying the surface of a bromoil, before inking up, with an alkaline solution, a 5 per cent. solution of potassium carbonate, because wherever the solution touches the gelatin it will subsequently swell up more and naturally refuse to take the greasy ink.

The learned doctor's description of how to attain the desired end is given as far as possible in his own words: "The cold swollen and absolutely dried sheet should be placed in a horizontal support, and the atomizer set in action; only when it is working absolutely evenly, should it be allowed to act as evenly as possible on the sheet and always under continuous observation so long until the whole sheet is evenly covered with a system of the finest little drops. The most important premise is the continuous observation of the sheet during the application of the swelling medium, and actually best by acute incident light. The practical arrangement for this is: The sheet should be laid on a table near a window. The worker takes his place opposite the window and brings his eye and the spray diffuser very slightly in front of and above the sheet to be sprayed. There is thus produced in every little drop a light reflection, which facilitates the observation of the system of drops."

The author goes on to describe how one must learn the idiosyncrasies of the spray diffuser, and practice first. After spraying, the sheet must not be touched, but left for a minute or so, the time being dependent on the temperature and the kind of paper and so on and so forth. The longer it is left the coarser the grain. The sheet should then be rinsed and soaked in water and inked up.—*Phot. Rund.*, 1920, *p.* 17.

VIEWS AND REVIEWS

The "British Journal" Almanac for 1920

The standard *British Journal Almanac* for 1920 has again come to hand, and we are surprised at the volume of advertising presented by the British manufacturer. Sandwiched in between these catalogues appears a smaller amount of reading matter, but none the less helpful. The editor writes on "Beginners' Failures in Photography" and there are some useful formulæ. It is a handbook that will be valued and appreciated by every photographer. Geo. Murphy, Inc., 57 E. Ninth Street, New York City, are the American agents.

Labor

The high cost of living, the high cost of material, has been and is being investigated in towns, cities and States in the entire country. Eventually every report is practically the same, that the high cost is brought about by the increased price of labor. We cannot understand why certain articles double in price in a short time. We don't mean to say there is no profit. In some cases there may be; but you will find upon investigation that the majority of people in business today, whether it is manufacturing, wholesale or retail, are making a smaller percentage of profit in many cases than they have ever made before.

It isn't the price of goods considered by many today, it's getting the goods when they want them. For illustration, a person may be able to find someone who will give him a lower price on paper, plates, chemicals, etc., than he can get from the regular supply house, someone who is doing sort of a commission business, getting the orders, then ordering the goods and delivering them when they can get the same. A 10 per cent. discount on $50 worth of goods only means $5, and if you yourself or your employees are unable to get work out on time and lose a day or two waiting for supplies, besides disappointing your customers and getting behind in other work that should be done, you have paid in the loss of labor many times more than the amount saved on the goods. Time or labor is the greatest expense today. Anything connected with business which means that we must pay for time which is not used, adds not only to our overhead but makes a big hole in our profits. A telegram may cost 50 cents and a letter may only cost 2 cents, but a telegram will oftentimes bring the goods, which adds to the profit, while the letter will bring the goods too late to be of service.

As we have said befors, it isn't the price which you pay for goods, it's your ability to get them when you want them and as you want them. We may pay an enormous price for some little device, but if it saves ten, fifteen or thirty minutes a day of one of our employees, it means at the end of the year that we have made money by purchasing the same. Labor is the one great item of expense, and every moment lost means so much taken from our profits.—*Ohio Photo News.*

The C. P. Goerz American Optical Company

The German ownership of the C. P. Goerz American Optical Company, consisting of 549 shares of its common stock, out of a total of 600 shares, together with all its photographic patents, trade names, and other valuable concessions, was sold by the Alien Property Custodian on March 5, 1920, to a syndicate of Boston financiers, composed mainly of members of two important banking houses.

The office and factory of the company will continue to be maintained as previously at 317 East Thirty-fourth Street, New York City, and the Company proposes to continue the manufacture of photographic lenses of the highest quality as an American enterprise entirely.

A force of highly skilled workers, together with the same supervising staff of experts, with their many years of practical experience in the making of anastigmat lenses, and under the management of Mr. Fred Schmid, who has been connected with the Company in executive positions for twenty years, will give full assurance that the standard of quality of the celebrated Goerz lenses will be fully maintained.

The demand for Goerz lenses continues to be very strong, and, at the present, facilities of the factory are taxed considerably to meet the urgent demand. The Company has lately succeeded, however, in furnishing the well-known Goerz Dagor, Dogmar and Hypar lenses in fairly good quantities, and there is every prospect that the volume of production of the many different types of lenses will soon greatly increase.

The prospects for a healthy growth of the Company seem very bright, and we may look forward to an increased activity of the Company in the near future.

Interesting Points of Law

The copyright of a picture of an article, machine or design of any kind does not prevent another person from making the article. It protects the picture and nothing more. If the copyright of a picture of a machine prevented the making of the machine it would be a patent.

The function of a copyright is to prevent one person from using the work of another. In making books, tables of statistics or maps, a second person can go through the same sources of data and information and independently work out or compile a chart, map or table that will not infringe the first, though it will necessarily resemble it.

So a photographer may take the same scene, building, person or article in similar lighting, weather conditions or pose and it will not be an infringement because he is not using the work done by the other.

The copyright of a book or periodical covers the individual pictures used as illustrations, but if the pictures are also published separately, they should be copyrighted separately.

Registration of Copyright. The registration of copyright is an exceedingly simple process. If a photograph is to be reproduced for sale, all that is necessary is to send two copies of the photograph, with the proper blank (J2) filled in, to the Librarian of Congress, Copyright Office, Washington, D. C.

If the photograph is not to be reproduced for sale, one print with the blank J1 filled in should be mailed to the Copyright Office. In the first case the prints should be sent immediately after publication, the published photograph being properly marked. The proper mark is the word "Copyright" or the abbreviation "Copr." or the letter C within a circle, with the name of the author or proprietor, or his initials or monogram, in which latter case his full name should appear on the back or margin of the print or on the mount. This permits the photographer to make a picture, mark it "Copyrighted," offer it for sale, or allow it to be published at once, provided two prints and properly filled blanks are immediately mailed to the Copyright Office with the necessary fee.

The fee is 50 cents unless a certificate is desired, in which case it is $1.00. The subject is fully explained in the "Rules and Regulations for the Registration of Claims for Copyright" which with any blanks desired may be obtained by addressing the Register of Copyrights, Library of Congress, Washington, D. C.

Who May Copyright. The law states that an author or proprietor has the right to copyright protection and that "author" includes the employer in the case of works made for hire. This, translated, means that the man who makes the picture has the right, unless he is paid by someone to make the pictures, in which case the man who pays for having the work done has the right to have the picture copyrighted.

In any case where there is a possibility of a question arising, it is a wise precaution to have an understanding and the rights of the parties reduced to writing. You can't expect to be paid for making a picture and retain the right to copyright it and use it as you please and, again, you can't expect to make a picture of a person, free of charge and expect to copyright it and use it for advertising or other purposes if your intent is not understood and permission granted. And if a copyright *is* taken out by a person *not* having proprietary rights, it is void and cannot be enforced.

Common Law Rights Prior to Publication. It is provided in the Copyright Law that nothing therein shall be construed to annul or limit the right of the author or proprietor of an unpublished work, and the question at once arises as to what these rights are.

If you go to a photographer to have your protrait made and pay him for his work the fact that the photograph has not been copyrighted does not make it public property, and the same applies when you take negatives to a photographer to have prints made. The photographer has no right to make extra prints from your negatives for any purpose. The U. S. Supreme Court has ruled that the property of the author in his unpublished work is absolute until he voluntarily parts with it.

It is difficult to state just what constitutes the publication of a photograph in the eyes of the law. The author may permit others to examine and enjoy his work under such restrictions as he may care to make and he does not publish, but if he puts his work in a public place where anyone may see and enjoy it, he may be said to have published it. Presumably then, the gift of your portrait to a friend would not be publication and would not give anyone the right to use it without your consent.

On the other hand, if you allowed your portrait to appear in public print or to be displayed with other photographs advertising amateur theatricals or for some similar purpose, the courts would probably hold that the picture had been published. The laws of different States might make slightly different rulings necessary depending upon the question involved. We merely want to show that there are common law rights and that these rights do not hold after a picture has been published.

You can be quite certain that if you make a very fine photograph and offer it for sale without its first being copyrighted, you have no protection against the person who may copy your picture and offer his copy for sale.—*Studio Light.*

Photograms for the Year

THIS fine annual of pictorial photography never presented a more representative collection, nor in a more worthy manner. Beautifully printed and ably edited, the volume contains the best that has been achieved in pictorial photography, and will be an inspiration and help to any art photographer who will be fortunate to possess a copy. Tennant & Ward, 103 Park Avenue, New York City, are the agents.

"Penrose's Annual" for 1920

AFTER a lapse of two years this attractive and welcome annual appears in a bright and beautiful dress.

The illustrations are unusually fine; most of them are in color by various processes. The articles by different authors are concise and give the reader an insight into the various methods of reproduction and also reveal to him the advance that is being made through photographic methods. Tennant & Ward, 103 Park Avenue, New York City, are the American agents.

The Ohio-Michigan-Indiana Convention

THIS year the Ohio-Michigan-Indiana Photographers' Association will hold its annual convention at Cedar Point, Ohio, July 6, 7, 8, 9, 1920. The hotel at that time of the year will not be crowded, and they have the positive assurance of the G. A. Boeckling Company that those attending the convention will be amply provided for in every way.

This will be an educational convention. It is expected that there will be a large exhibit of photographs that sell for real money. There will be a limited number of prizes, there being a Pictorial Class open to the world, and a Studio Portrait Class, Home Portrait Class and Commercial Class from Ohio, Michigan and Indiana photographers; also a Complimentary exhibit. From all pictures exhibited, including the Complimentary exhibit, a selection will be made for the Interstate Trophy. This Interstate Trophy is, of itself, of sufficient importance for getting out a large representative exhibit.

The Studio and Home Portrait Classes are to be from negatives from which photographs have been sold as portraits in the regular course of business, and the prints exhibited must be finished exactly as delivered to customer, including mount and folder, or frame.

The talks and demonstrations will be along practical lines, the kind that will be helpful for everyday work in the studio. There are to be talks on business getting, salesmanship, and demonstrations on flash- and electric-light operating. They hope to have an artist who will talk on art as applied to photography, and will also be free to criticise the work from an artistic standpoint.

There is no place in the country where entertainment features can be put on as well as at Cedar Point. There will be water sports, a masquerade ball, a beach party, a banquet and a real minstrel show.

Plan *now* to attend the O-M-I Convention at Cedar Point.—*Abel's Weekly.*

The WORKROOM

CONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

The Preparation and Renovation of Backgrounds
A Hint for Background Workers
Photographing Graves
Facts and Figures from a Note Book
Toward the Light
Underexposure
The Reduction of Negatives and Prints
Lantern Slides and the Enlarger
Why Mounted Prints "Come Up"
Copying in Black and White
Notes for Double-transfer Carbon
A Stunt Worth Knowing
Milky Fixing-baths
Dry Plate Dont's
Relief Photography
Useful Hints for the Line Operator and Etcher
Packing Negatives for Shipment
The Proeess of Photo-Zincography
The Copying of Photographic Prints
Keeping Chemicals
The Iron Developer for Black and Sulphide-Toned Bromide Prints
Bomide Toning Processes
Photographic Materials and Processes

THE WORKROOM

By the Head Operator

The Preparation and Renovation of Backgrounds

THERE are few photographers who have not at some time or other felt a desire to paint a background, but of those who have essayed the task only a small proportion have felt satisfied with the result. In the majority of cases this is due to the use of improper materials and tools, and in others to ignorance of the proper methods of mixing and employing them.

The materials usually employed as the basis of backgrounds are stout unbleached sheeting and scene painter's canvas. The former is cheap and good enough for all ordinary purposes, while the latter is more expensive and at the same time more durable and of a better substance, being much less liable to accidental punctures with head-rest or the corners of accessories. Our first requirement is a frame on which the material may be strained for painting; if none of suitable size exists in the studio, one should be made of stout "slate batterns," which may be bought very cheaply at any timber yard. They should be "halved" at the corners so that the frame has a flush surface, and fastened together with quarter-inch bolts and nuts. The former should have flat heads; these cost about three halfpence each, and four are needed. In order to keep the frame square, a couple of stretchers should be nailed on to the back, diagonally across two opposite corners. These are best fixed on with wire nails, so that they can be easily removed when the frame is to be taken to pieces. It is advisable to procure the sheeting before making this frame, as sometimes the width is barely as wide as it is supposed to be, and makeshift methods of stretching have to be adopted. The fabric should be brought over the edge of the frame, and fastened with ordinary tin tacks, taking care not to drive these quite home, so that they may be easily pulled out with pincers when the work is completed. The object of putting the nails on the edge of the frame instead of on the flat is to provide a smooth surface to the extreme edge of the frame, so that the brush will not catch on the tacks. Whether the medium to be employed be distemper or oil color, it is always desirable to size the canvas well first, and in the case of oil it is absolutely necessary. This is done by giving a coat either of warm size, such as is used by paperhangers, or one of starch paste, as made for mounting. This may be applied with an ordinary distemper brush, and must be well rubbed into the material and allowed to dry. While this is going on the distemper may be mixed or, better still, it should have been made at the commencement of the job, as it works smoother after having been mixed a few days.

The popular idea of mixing size color is to start with a lot of white and to attempt to bring it to the proper tint by adding the black or brown pigment, but for backgrounds, at all events, it is better to take the dark color first and to add the white to it until the desired tint is obtained. If scenic or clouded backgrounds are to be made, it is a good plan to mix the black or brown and the white separately, and to make the intermediate shades from them in separate pots or basins. Small quantities can be mixed on a piece of board, which serves also as a palette. The color may be mixed in any deep basin or small pail. It is advisable to mix the powder color to a creamy consistency with cold water, and when all lumps are broken up to add enough hot size to make it as thick as ordinary oil paint. When cold it should form a thin jelly, which can readily be spread with the brush without going into lumps. If possible, the paint should be squeezed through muslin or rubbed through a hair sieve; this will prevent streaks in the coating, caused by undissolved particles of color.

It must always be remembered that size color is many shades darker when wet than when dry, so that it will be necessary to place a dab from each pot of color upon a piece of brown paper, and to dry them thoroughly, before commencing the painting. This rough "color chart" will show the value of each touch on the finished background. A common mistake is to make the color too thin, for if this is the case it will be found impossible to secure freedom from streaks, besides being very messy and unpleasant to use. If the paint shows the slightest tendency to run when applied freely to the canvas it will be necessary to add more strong size to it and to allow it to cool. A little melted glue is very useful, as it stiffens the color without further diluting it.

Good brushes are essential to successful work, as there is nothing so annoying as to have to keep stopping work to remove loose bristles, while a harsh stiff brush which has perhaps been used for oil paint will inevitably produce a rough scratchy effect, not perhaps harmful from the photographic point of view, but not by any means workmanlike in appearance. Perfectly plain backgrounds can be covered by means of an ordinary flat distemper brush, such as is used for walls and ceilings, but for clouds or scenic work round brushes are much better. One about two and a half inches in diameter will be as large as is necessary, with one or two "sash tools" for smaller details; for straight lines, as in doors or windows, large hog tools are useful, as they are somewhat firmer in their touch. These are used in conjunction with a long ruler made of a strip of wood about three inches wide and a half-inch thick.

No useful purpose is served by giving the whole surface a coat of the lightest tint and then working the darker portions over it; on the contrary, it is better to sketch out the effects in faint outline, say, in blue chalk, and to work up to full strength in each part at the first painting. By so doing there will only be one thickness of color on the canvas, and there will be no tendency for it to flake off when the background is rolled up. As a general rule, the texture of the sheeting should only just be lost when the background is dry, and the surface should feel decidedly rough to the hand. If it feels smooth and the cloth is quite stiff, it means either that the color has been laid on too thickly or that too much size has been used. The novice will do well to confine his first attempts to some clouded head-grounds about 54 inches square. These will be more easily managed, and if unsuccessful will not be so disappointing as would one of the full size (8 feet square).

The materials used for the distemper are, for gray tones, ordinary whiting and lampblack, with a trace of Venetian red to give a little warmth; the red takes off the cold slaty tint and gives a better effect in the negative. For browns, whiting and burnt umber for warm tones, with a little lampblack added for colder ones. For white "sketch" grounds, whiting, with ordinary laundry blue squeezed in to the mixed color till the mass is of a fairly bright blue. This will dry to a bluish white. For the darkest shades the black or brown should be used without any admixture of white. Vegetable black may be used instead of lampblack; it is easier to mix, but has not the same depth.

Oil colors are now seldom used for background painting, possibly on account of the extra time necessary to apply them and their greater cost. The chief difficulty with them is to avoid gloss. It is almost impossible to do this when using ready mixed paints. The right way to get to work is to go to a good colorman and to ask for the necessary color, say, burnt umber or black, "ground in oil." This should be in a thick paste, which is reduced to a workable consistency with turpentine alone. A little should be tried upon a piece of sized wood, and if it cannot be rubbed off when dry it is fit to use; if powdery, a little raw linseed oil may be added to the turpentine, and another trial made. When there is no gloss, and yet the color is fast, then the paint is in good condition. It is hardly necessary to say that, in all cases, the sheeting or canvas must be well sized before coating with oil paint. The great advantages of oil-painted grounds are durability and the fact that the true effect can be judged while actually painting without waiting for the work to dry. Alterations may also be made at any time without making the work look patchy.

A method which is periodically referred to is the dry or pastel process of making backgrounds, invented by Robert Faulkner. In this, powder colors are used, the umber, black, or white being mixed with dextrine and dusted upon a damp canvas, into which they are scrubbed with an ordinary clothes brush. It is, of course, only possible to get very "soft" effects in this way, and I fancy the process is more talked about than practised.

Sketch backgrounds may easily be made from continuous cartridge paper, the desired design being put in with shoe-maker's heelball. As this is rather hard, it is necessary to work upon a smooth table to avoid damaging the paper. Conté crayons are easier to use, but are liable to smear, which the heelball is not.

When attempting to paint a scenic background, it is always desirable to make a small sketch, say, of cabinet size, and to test the effect with a figure or two cut out from ordinary prints. This will ensure the correct disposition of light and shade. This sketch should then be ruled over into one-inch squares, and the background ruled with the same number of squares on a larger scale. Thus with an 8-inch sketch the squares will have to be 12 inches wide on an 8 foot background. The lines may be made in chalk or pencil, and are covered up by the painting. The idea is to facilitate the placing of the sketch upon the canvas, as the portion contained in each little square is drawn in on the corresponding square on the canvas. Another plan is to make a negative of the sketch, and to project it upon the canvas by means of an enlarging lantern and lightly drawing in the outlines in chalk or pencil.

Old backgrounds are treated in the same way as new ones, and some very hard and obtrusive specimens may be greatly improved by giving a coat of thin color all over, and allowing the subject to show through. I once cured a very aggressive conservatory ground by this treatment. Before you saw the background instead of the sitter, afterward it gave a mere sketchy suggestion. Torn or damaged grounds should be patched at the back with a piece of sheeting glued on and a piece of tough thin paper over the rent on the face; this will be quite invisible when worked over.

Many of the ready-made distempers or water paints are available for background work, although they do not handle so nicely as good size colors. If such be used, care must be taken not to make them too thin, or they will run all over the place.

Above all, when painting a scenic background, remember that it is only an accessory to the picture. If the background itself is a success as a picture, it will almost certainly be a failure in its proper position. Aim at simplicity and breadth, and take your ideas from the works of the great painters rather than from the dealers' lists.—*B. J.*

A Hint for Background Workers

HAVE you ever noticed how difficult it is to get a really good point to your india rubber when picking out high-lights or the cloudy effects in sketch background and pencil point work? You will find the blacklead rubs off into the point of the rubber, and necessitating continually cleaning the point. Even then one is apt to spoil the effect, because of the black smudge made by the soiled and ragged end. I find, however, Windsor and Newton's kneaded rubber to be a splendid remedy for this trouble, since you can make it any shape you wish—either a good solid piece, a thin point, or a flat edge. Then, again, if you just alter the shape, after using it for two or three strokes it cleans the point, and you will not have any bother about dirty marks.

I usually cut it into three portions, as then you can insure cleanliness, and also it is more economical. If by leaving it exposed to the air it gets very hard and difficult to twist and turn as you want it, try holding it in front of the fire for a few minutes, and work it up in your hands a little, and you will find it will become quite pliable again.—*B. J.*

Photographing Graves

Many people desire to have the grave of a departed relative photographed with the wreaths displayed—that is, soon after the funeral ceremony. In this work it always pays to take pains to do it well, and especially to get the proof print submitted quickly, for sometimes relatives who have sent a wreath will like to have a copy, yet a very little time elapses before their keen interest evaporates. It may seem cynical, but it is a fact none the less. Also, if the picture of the wreaths turns out well, an order for a representation of the gravestone will very likely follow in due course.

The work is not so simple that a few hints may not be welcome as to the best ways of satisfying the customer. The best plate to use is undoubtedly one of the new type of "non-filter," as the subject can seldom be managed with a filter in the lens owing to the movement caused by wind, especially of the maidenhair fern, which is used so largely in wreaths. Should the wind prevent a sufficiently long exposure for the small stop needed, it can be given in instalments by watching for a lull, when the quivering flowers and leaves remain still for an instant; but this operation needs great care to avoid vibration of the camera. In the absence of a portrait shutter, which is best for intermittent exposures of this kind, a good substitute can be made by relaxing the spring of an ordinary roller-blind T-I shutter and exposing by gently pulling and releasing the cord. Several short periods can be given to make up the required exposure if care be taken.

It is best to use a fairly long focus lens to avoid disproportion of size between various wreaths; a fairly high stand will enable one to fill the plate well, especially if a little time is spent first of all in propping up and otherwise arranging the wreaths to their best advantage, but at the same time they must not be "posed" too obviously. The long-focus lens also enables one to get the surrounding ground well diffused. It is well to take a view from each of two opposite corners, and many people will be extra pleased if they can see the writing on the card of their particular wreath, even if it takes a strong magnifying glass to read it.

Much the same remarks apply to photographing the grave when the stone has been set up. It is not always possible to get far enough away to avoid some little exaggeration of perspective, but the essential point is that the lettering should be clear, and to this end careful choice of the time when the light is shining diagonally on to the stone and a fairly slow plate are the principal means.—*B. J.*

Facts and Figures from a Note Book

Pinholes in the blinds of focal-plane or roller-blind shutters may be eliminated by mixing up lampblack and rubber solution (as used for cycle tires). Mix to a paste and rub well in. The blind should be left exposed to the atmosphere as long as possible, and should be dusted over with French chalk before being wound.

Plates backed in the dark-room frequently suffer from spots of backing on the face of the plate. This can be avoided by backing plates in pairs, as they come from the box. This also gives a little protection from any stray light during drying.

It is sometimes necessary to cut down plates, either to make an unusual size or to replace a run-out stock of a standard size. Plates cut down in this way are often spoilt by small particles of glass getting on to the emulsion and grinding in, causing much work for the spotter. All this is avoided with a little care. Firstly, use a cutting guide, and make every cut a clean one. It is easy to do this with either a diamond or a wheel cutter if the correct angle for use is found. Cut the plates without separating the pairs as they come from the box; do not separate them until they are required for use, and then as soon as the unwanted portion is broken off give the plate a sharp tap on the edge of a bench, holding it in a vertical position when so doing. When cut plates have to be repacked, do not break them, but leave them in pairs complete; it is easy to snap them off when required.

There are two classes of originals which a photographer is often asked to copy that may be very greatly improved before the copying process is begun. First, there is the dirty and cracked albumen or gelatin print. The best method of preparing this is as follows: First rub carefully over with stale breadcrumbs (this is safer and more effective than rubber). Work off all the dirt you can in this way and then soak the print in glycerin. When well soaked a lot more dirt may be worked off with the finger-tips. When the print is as clean as it is possible to make it, it is ready to copy. If the cracks are very bad it is best not to dry the print, but while it is still wet with the glycerin squeeze it into contact with a thin clear glass. The cracks will be very obvious, but may be made almost invisible by squeegeeing a piece of white paper into the still wet back of the print. The copy is made through the glass, and though the glycerin takes a long time to dry it is best to finish as quickly as possible.

This method is perfectly safe, and may be used on any original, but the next should only be used when permission can be obtained, for, although it is, as a rule, perfectly safe, it may very occasionally ruin an original. When a print (non-photographic) or etching has to be copied and the paper base is discolored through age or bad storage it can be very much improved by an immersion in a weak solution of ordinary bleaching powder in water, about ½ ounce of fresh bleaching powder to a pint of water is about right. In bad cases a few drops of hydrochloric acid added to the above will hasten the cleaning up. The solution must be washed well out of the print after use. This is a fairly safe method with any ink image, but is useless for photographic originals.

Some photographers, especially those who travel and those whose dark-rooms are not heated, may be glad to hear of a developer practically uninfluenced by changes in temperature. This is pyrocatechin, a very useful all-round developer.

P. O. P. is not the popular process that it was at one time, but there is still an enormous quantity of it used. It is not uncommon to find a P. O. P. very much overprinted. It is sometimes inconvenient to make another print, and it is not necessary as there are several reduction processes which will give excellent results.

To my mind the best results are obtained by fixing the untoned print in a strong hypo bath, and then toning with soda sulphide. The print may be placed in this direct, or it may be bleached first, as is usual with bromide prints. This method gives very great reduction. A slight reduction may be often effected by leaving the toned print in a strong hypo bath for an hour or so.

In pre-war days the black tones obtained on C. C. paper by the platinum-toning method were much admired. Platinum is now at such a high price that its use is almost barred, but much the same tones may be obtained by adding a little chloride of line to the usual P. O. P. toning bath. There is some doubt as to the permanence of prints so made, but I have seen prints toned by this method ten years ago, and they are still as fresh as on the day they were made.—*B. J.*

Toward the Light

Many excellent effects in bust and half-length portraits are to be obtained by taking a three-quarter face view, the camera being placed on the shadow side. There is, however, very frequently a tendency to hardness in such pictures, the high-lights being too dense and lacking in flesh texture. To a certain extent this may be due to overdevelopment, but we think more often to overlighting. If a screen of butter muslin or similar thin material be placed near the head to soften the direct light a great improvement will be evident in the lighting, and that without lengthening the exposure. When taking such strongly-lighted subjects it is a good plan to open a blind at the camera end of the studio, as this will illuminate the shadow side softly without destroying the modelling, as a reflector often does. If the effect is at first not quite satisfactory it is better to alter the position of the head and the camera in preference to touching the blinds. The method we advocate has the advantage that the sitter may be brought nearer the light, whether day or artificial, with a consequent reduction in exposure.—*B. J.*

Underexposure

In spite of the progressive increase in the sensitiveness of plates there is still probably no more common error in portrait work than that of giving insufficient exposure. No matter what facilities are offered to him in the shape of rapid lenses or super-sensitive emulsions the average operator employs them, not to improve the quality of his work, but to reduce still further the time of exposure. On looking over a few old wet-collodion negatives recently we could not help noticing that they were much better "covered" than are the majority of present-day exposures; that is to say, that the areas of deep shadow in them were very small compared with the average modern negative. It must, of course, be understood that we are speaking of the same class of work in each case, ordinary "three-quarter" lighted figures, and not of negatives made for special effects where broad masses of light and shade are sought for, as it would be foolish to set up a uniform standard of quality in negatives and expect all varieties of work to conform to it. Departure from rules and traditions as to lighting and quality of negatives has undoubtedly made for the artistic development of photography, and to those who are capable of taking their own line we have nothing to say on this point, but there are many whose ambitions do not go beyond good everyday work, and whose desire is to produce portraits which, to quote an old newspaper notice, are "soft, brilliant and full of life." The first two qualities may appear to some to be incompatible, but they may be combined if due attention be given to exposure and development. This can only be done by thoroughly mastering the qualities of the plate it is intended to use by experiment and observation, as not only do the plates of different makers behave very differently but different grades of the same make exhibit widely different characteristics. One well known plate enjoys great popularity because it develops up to printing density quickly, and therefore gives the idea that the exposure has been adequate, but upon examination the negatives will often be found hard and poor in shadow detail. A faster grade of the same make takes rather longer to appear and consequently to develop to the same density, with the result that it is accused of giving flat images.

We are afraid that there is still existent in many quarters the old heresy that thin negatives mean the best results in bromide printing, an idea which has been, and is, disastrous to the quality of negative and print alike. This is proved by the fact that makers are forced to bring out "hard" or "contrasty" papers to keep pace with the declining density of the plates; a better way would be first to secure a good negative and then to choose a paper to suit it.

Careful development is necessary, no matter what plate is used or what exposure given, and we strongly recommend study of the factorial system to the operator who finds that any considerable proportion of his negatives require after-treatment in the way of intensification or reduction. By the use of this system, which after a time may be almost subconscious, it is easy to secure negatives which are uniform in density, and being based entirely upon time the common errors of overdeveloping underexposed plates and underdeveloping overexposed ones are entirely avoided, as is also that of mistaking a slight surface fog over the shadows for overexposure.

At the present season it is certainly not easy to secure brilliant negatives in large towns, but the difficulty is aggravated rather than reduced by shortening the exposure. With a fuller exposure the high-lights will attain greater relative density in relation to the shadows, when compared with those which have not received enough exposure to give a sufficiently dense image, no matter how far the development be carried.

In attempting to alter the quality of one's negatives haphazard variations should not be made in ordinary practice; that is to say, that the fullest benefit cannot be obtained by deciding to give a little more exposure. What should be done is to find out how much more exposure will give the best result, and this can only be done by making trial exposures of varying lengths upon the errand boy or the receptionist and developing in the usual way. It was a maxim of the late William Bedford, a master of technic, that to get perfect negatives the exposure should be suited to the development and not *vice versa*. It is an economical and convenient plan to devise some arrangement for giving several exposures upon one plate so that all may receive equal development. It may not be known to many young photographers that exposures in the ratios of 1, 2, 4 and 8 may be made and developed in this way, and that all four will yield images of practical printing value, although the density of each, of course, is different; probably 1, 2, 3 and 4 would be a more useful series for the purpose we have outlined.—*B. J.*

The Reduction of Negatives and Prints

ALTHOUGH almost as necessary a process as intensification, the reduction of photographic images, either negative or positive, is not usually carried out with equal success, even the simplest methods being regarded as risky by many operators. There is no good reason for this idea, for with ordinary care there is no danger either of destroying the image or staining the film.

Nearly all non-mechanical methods of reduction consist in converting a portion of the metallic silver image into a soluble salt which can be removed by a "fixing" agent such as cyanide of potassium or more commonly hypo, the outstanding exception being the persulphate method, in which a silver salt soluble in water is formed.

The process of reduction, like that of intensification, may be carried out in either one or two stages, the latter being the earlier form, the soluble salt being formed by immersion of the negative in one solution while the removal was effected in another. As examples of this, I may give a preliminary bath of perchloride of iron or of diluted tincture of iodine followed by a plain solution of hyposulphite of soda. This procedure was effective in its way, but had the disadvantage of not being under control, as it was difficult to judge of the amount of reduction until the negative was removed from the hypo bath. It was therefore a great advance when Mr. Howard Farmer introduced the ferricyanide and hypo reducer, in which the conversion of the silver into a soluble form and its solution took place simultaneously, thereby permiting any desired degree of reduction to be obtained.

It should be noted that in the case of nearly all reducing solutions the degree of concentration has a marked effect upon the result, a strong solution dissolving the more delicate halftones away entirely before any perceptible effect is made upon the high-lights, while a weak solution has a more even effect all over the image. This may be taken advantage of, as it allows of fog being quickly removed by a strong solution if it be desired to do so before intensification.

Most of the troubles which occur in reduction may be avoided if ordinary care be exercised in preparing and using the solutions, and I therefore give clear instructions which, if followed, will help to avoid stains and uneven action.

The ferricyanide and hypo or Farmer's reducer is the most generally useful, as its action is easily controlled, and there is no difficulty in its preparation. Where it is in constant use the best plan is to have two stock bottles, one containing a plain hypo solution containing three ounces of hypo to the pint, and the other a 10 per cent. solution of potass. ferricyanide. These are mixed for use in such proportions as may be needed, the color being a good guide. Thus, if we take, say, two ounces of hypo solution and add to this enough ferricyanide solution to give a pale lemon yellow, the action will be slow, but even—that is to say, that the high-lights will be reduced in the same proportion as the shadow details or any fog which may be upon the deep shadows. A large proportion of ferricyanide, giving a deep golden yellow, acts very quickly and will clear fog off the deep shadows of a negative before it has time to penetrate into the film sufficiently to affect the image to any appreciable extent. This property is very useful when dealing with overexposed and overdeveloped negatives, such as are occasionally met with in tank development. It is a good plan, and economical of chemicals, to apply the strong solution with a swab of cotton wool, of course keeping the latter in constant motion. This also allows of a little local action, so that a white skirt or bodice may be reduced without unduly affecting the face, hands, or other draperies.

There are a few precautions which must be taken to make sure of clean working. The hypo solution must be clean and fresh, and an acid fixing-bath must not be used. A weak hypo solution must not be used, as this tends to give yellow stains. I have seen it recommended in some text-books to take a couple of ounces of water, to add to this a few drops of fixing-bath and a few drops of ferricyanide solution to make the reducer. Such a proceeding leads to an unjust condemnation of the method as useless. The mixed solutions must not be used in a strong light, as the ferricyanide is rapidly decomposed, the solution first bleaching and then turning a pale blue. Some workers prefer to dissolve the crystals of ferricyanide directly in the hypo solution. This is equally effective with using a 10-per cent. solution, but is a little more trouble, as the mixed reducer will only keep active for a very short time.

If through disregard of the foregoing precautions yellow stains occur, they may generally be removed either by the iodine and cyanide reducer or by a weak solution of potassium cyanide.

While the "Farmer" reducer tends to give increased contrast, the persulphate reducer has an opposite tendency, and will so alter the character of a harsh underexposed and over-developed negative that quite soft prints may be obtained. It is very simple in action, but, curiously enough, I have found more people make a mess of its use than almost any other process in negative-making. Flat overexposed negatives are not suitable for this method, no matter how dense they may be. The type that it is especially useful for is a sitter in dark clothes, where there has been considerable underexposure, and the hands and face over-developed in an attempt to secure detail in the shadows.

We require two solutions, both of which should be freshly made. One is ten grains of ammonium persulphate to each ounce of water. This I usually mix in the dish immediately before use. The other is a 5-per cent. or, even better, a 10-per cent. solution of sodium sulphite, which is kept in a dish ready for immediate use. The negative must be perfectly free from hypo, and should be well soaked in water before reducing it if it has been allowed to dry after fixing and washing. It is then immersed in the persulphate solution. The action may commence at once, or it may be ten minutes before any action is visible, which, if the solution be made with tap water, is manifested by a milky appearance. As soon as this is noticed the negative must be constantly watched, as reduction then proceeds rapidly, and it is easy to overdo it. As soon as the desired point is reached the negative is quickly rinsed under the tap and transferred to the sulphite solution, in which it should remain at least ten minutes, after which it should be well washed.

Some samples of persulphate will not attack the image at all until slightly acidified. If no action is visible after ten minutes' immersion, remove the negative from the solution and drop in a very small quantity of dilute sulphuric acid (one part acid to nine parts water). Ten minims of this is ample for two ounces of the persulphate solution. If too much be added, the action will be very rapid and uneven, the image going to a pinkish ghost before the action can be stopped. If the negative has been handled with fingers contaminated with hypo, any portions which have been touched will refuse to reduce or, at all events, hang back behind the clean portions.

A very clean and useful reducer is that composed of iodine and cyanide of potassium. The action of this is very similar to that of the "Farmer" reducer, but as it is extremely poisonous, it is not so generally used. I have, however, found it so useful upon stained negatives and prints that I give details of its preparation and use for those who are careful not to leave cyanide about loose. This caution may seem superfluous, but when I say that I have seen a girl using a 5-per cent. solution of cyanide from an ordinary teacup which a few minutes before had been used for its legitimate purpose, it is not so in all cases.

Two stock solutions which will keep indefinitely are made thus:

A

Potass iodide	150 gr.
Water	2 dr.
Iodine (in flakes)	45 gr.

(Stir till dissolved and make up to 1 oz. with water.)

B

Potass cyanide	1 oz.
Water to	10 oz.

For use, take for average work 30 minims of A and 5 minims of B to each ounce of solution. It may be used much stronger or weaker, to suit special cases. I have found this reducer very useful for cleaning green fog off negatives, and also for removing the muddy appearance caused by the forced development of bromide prints. I prefer this reducer before all others for lantern slides or other transparencies, as it does not alter the color of the image in the slightest degree.

Both this reducer and the ferricyanide and hypo are suitable for bromide and gas-light prints but I have not found it desirable to immerse the prints in the solution. A better way is to lay the print on a glass plate or the bottom of an inverted porcelain dish and to swab the solution over with cotton wool, occasionally rinsing under the tap. Stained margins may be cleaned and faulty vignettes corrected very easily.

There is another way of using iodine for reducing bromides which may be referred to, as it affords a means of brightening up a flat print. It is to take, say, a dram of the iodine solution (A) in ten ounces of water and to immerse the print until the high-lights begin to turn blue. The back of the paper quickly turns blue, but no notice must be taken of this. The print is then rinsed and transferred to a plain hypo bath (3 ozs. to the pint), in which it should be left for five minutes. If the reduction is insufficient, the process may be repeated, taking care to wash out all traces of hypo thoroughly beforehand.

I have found no really satisfactory way of reducing P. O. P. prints without altering their color. On the whole, a very weak solution of cyanide seems the most satisfactory. A dram of 10-per-cent. solution in a quart of water is quite strong enough, and with some papers this might be diluted to one-half strength. The reduction should take place slowly or the half-tones will entirely disappear.—*B. J.*

Lantern Slides and the Enlarger

In our articles on Copying we have shown how the apparatus may be used for a form of copying, namely, the making of lantern-slides by the camera, a negative being copied on to a lantern-plate by transmitted light. While we prefer this method of producing "quality" slides to any other, the ordinary condenser enlarging apparatus, provided ground glass is used between the lamp and the condenser, will enable one to make good slides very rapidly. But it should be noted that this method employs the apparatus as a *reducer*, not as an *enlarger*, and that the conjugates are therefore reversed in position; that is, the longer conjugate is from negative to lens, and the shorter from lens to easel. In enlarging with a 10-inch lens, the distance from lens to negative will only be 17½ inches when half-plate is being enlarged to whole-plate, while the distance from lens to easel will be 23⅓ inches. But while an extension of, say, 18 inches will thus enable most *enlarging* work to be done, much more is needed for reductions. Half-plate to lantern-slide means half-size, and the distances would be lens to negative 30 inches, and lens to easel 15 inches. Few enlargers provide for such extension, though they might be made to do so at little extra cost. A lens of shorter focus might be used, but this would necessitate cutting a hole in the easel and focussing on a ground glass, which the plate would replace for exposure. Such a method has its disadvantages in that it upsets ordinary enlarging conditions in many cases, and, further, does not facilitate the placing of the image on the lantern-plate. Where the plate simply rests on three blanket-pins stuck into the easel, focussing and "placing" of the image may be done on a waste plate covered with a piece of thin smooth white paper, this focussing screen being moved into position before the pins are put in. The use of a short focus lens renders the distance between lens and easel too small to work conveniently in this way; hence our point, that ample extension is desirable in the enlarger used for all-round business purposes.—*B. J.*

Why Mounted Prints "Come Up"

WHAT photographer has not felt a wave of resentment and disgust when a number of what were believed to be nicely-mounted prints begin to lift at the edges, calling for the tedious and often unsightly remedy of passing a paste-brush under the unstuck parts and rubbing them down again? This is one of the many reasons why dry-mounting has become so popular, but even with that the same trouble occasionally crops up, though more rarely.

It is thought that a brief consideration of the factors which aid complete and permanent adhesion between print and mount, compared with those that militate against it, may be useful.

Mounts of a greasy surface are unusual nowadays, but cannot be altogether dismissed. These sometimes make wet prints refuse to stick, but do not generally repel adhesive tissue. Greasy prints are seldom thought of, yet it is evident that the frequent handling a print undergoes during examination in the frame, trimming, and other manipulations may very well lead to greasy or, at least, repellent edges where fingers are not kept perfectly clean, or where the worker has a habit of running them through his hair. A puzzling case of prints lifting at the edges which for a time defied solution was finally traced to newspaper backing of an oily nature in the frames.

In pursuit of more common causes, mounting with starch will be dealt with first, as this is still perhaps the most used, although old-fashioned and fast being ousted. Here, as with other wet mountants, adhesion is partially due at the commencement to what may unscientifically be called suction, in reality atmospheric pressure, the full power of the adhesive not being exerted till it dries. Hence the worker is apt to feel a misleading security when actually using starch that is too weak or thin, since the prints seem to hold all right when rubbed down. As they dry, however, the air gets in between print and mount at the most accessible parts—namely, the edges, and lifting begins, helped by contraction.

The starch should be obtained from a photographic dealer, for many of the laundry starches now sold are poor or adulterated. Mounts of a too absorbent kind should be avoided. Pasting prints in a pile is doubtless a labor-saving necessity, but is certainly to be deprecated, as it is difficult to expel the water right to the edges owing to capillarity. On no account should smaller prints be laid on top of the pile, for this prevents uniform squeegeeing away of the surplus water. The usual practice is to begin pasting in the middle, but it is better to do the edges first, then to paste all over, rubbing well in, and, lastly, to go again round the edges. Extracting lumps or specks with a knife or the finger needs caution, the mountant being thus often removed. Such an occurrence should be watched for, and the part again touched with the brush. Lifting the print by the edges should be avoided for a similar reason.

A further point to bear in mind is not to make more starch at a time than is required. The adhesiveness of plain starch deteriorates much more quickly than many imagine, sometimes in a day, although putrefaction may be absent. A drop or two of oil of cloves is a useful preservative, and will prevent a future musty smell, but it is not recommended to keep starch paste even with this addition. The methylated spirit often advised in starch recipes is simply a preventive of cockling, though to some extent antiseptic.

Thick mountants of the Higgins type are far better than starch, and when properly applied never give trouble. They lose in tenacity, however, by uneven dilution. Hence it is desirable that the prints should either be dry or but slightly moist. With dry prints smartness is essential in applying the mountant and in rubbing down, or it may partially dry on the print before adhesion is attained, and such portions will obviously "come up."

Gelatin solution is a very tricky mountant, and comparatively few make a success of it, though the results are excellent in careful hands. In mounting a large batch, especially in cold weather, it frequently happens that the vessel containing the gelatin solution is allowed to cool unduly. Contact with the wet print further chills the gelatin, which may consequently be almost filmed over before reaching the mount, the adhesion, therefore, leaving much to be desired. Gelatin solution needs to be kept at a constant temperature during use, and the room should be adequately warmed. Hard gelatin must never be employed, only soft; too thin a solution must be avoided; and, as with starch, it is not good policy to save any that is left over. It can certainly be done by adding a preservative, but repeated melting gradually detracts from the adhesive property—at least, that is the writer's experience.

Dextrine is a tenacious and singularly permanent mountant, as anyone can testify who has noticed how determinedly old postage stamps resist removal. But the best white dextrine only should be used, the cheaper kinds being markedly inferior. It keeps well, which some may consider a merit.

Lastly, we come to dry-mounting with adhesive tissue, the most up-to-date and cleanly method, and the only one which absolutely abolishes cockling or curving. The chief pitfall here is the use of bad material. The best advice is to keep to one of the recognized brands, for latterly a good deal of tissue has been sold which varies in adhesive power, possibly by the employment of inferior lac. It may be noted that the best freshly-bleached shellac is called for, which has to be kept from exposure to air, or under water, till wanted, otherwise it oxidizes and becomes insoluble. Whether this insolubility also implies infusibility is not clear; but, if so, it is probable that the prepared tissue itself needs to be kept from the air to avoid deterioration. This is readily done by wrapping it up and placing under pressure in a closed box. The idea appears to find corroboration from the fact that complaints are seldom made by small users of tissue, but rather by those who buy it in bulk and, presumably, do not store it well. In mounting, care is required to ensure an even temperature; also the pressure should be uniform, adequate, and not too hastily removed. Quick cooling is desirable, hence the prints should not be laid on a pile as mounted, which may easily lead to resoftening of the tissue. Several obscure instances of dry-mounted prints blistering or "coming up" were tracked down solely to the last-mentioned cause.—A. Lockett, in *B. J.*

Copying in Black and White

On several previous occasions practical instructions have been given in the pages of this journal relating to the process of copying by means of the camera. These have been generally concerned with the methods of copying a color picture, or one containing half-tones such as an ordinary photograph—methods now fairly well understood by most amateurs; but the phase of copying that appears at first sight to be the easiest is the one that apparently most photographers find greatest difficulty with. We refer to subjects in black and white: that is to say, pictures or letterpress that are represented entirely by black lines or solid masses on a white base, without any half-tones at all.

To take a concrete example: and no better example can be suggested than a page of letterpress in black ink on white paper, say, for instance, a boldly printed page containing type lettering only, such as may be found among the advertisements in this journal. We are inclined to think that not one in a hundred readers could take the page in question and make a photographic reproduction of it on white bromide paper that, except for the different surface texture of the paper, would be indistinguishable from it, so far as the black-and-white rendering was concerned. The same doubt applies in the production of a lantern slide reproduction of such a page. Yet it is a task that is really easy of achievement if set about in the proper way; and the same instructions would apply to the facsimile reproduction in black and white of engravings, etchings, and pen-and-ink drawings.

The secret of success in copying a black-and-white subject is in the choice of a suitable slow well-backed plate that will readily give considerable density; giving an exposure that in no circumstances errs on the side of overexposure; and using a developer that is not only well restrained, but is both clean-working and capable of giving considerable density without fog.

In practice, it will be found that a plate which is usually described in the plate-makers' lists as "photomechanical" is best for the purpose. This is a plate with a very slow emulsion, generally about H. and D. 10, approximately the same as that of a lantern plate, and fine in grain. If, however, this particular type of plate is unobtainable, the slowest that is available should be used. In any case, a plate not faster than that known as "landscape" or "ordinary" should be employed. Such plates have an H. and D. speed number of from 50 to 100. With any higher speed plate than this, the problem of obtaining a clean, black-and-white result becomes much more difficult. Above all, it is essential, if a perfectly clean black-and-white result is required, that the plate be properly backed; otherwise halation from the white paper will certainly blur and may even obliterate some of the finer black lines.

The illumination of the page or subject to be copied should receive careful attention. We need not again refer to the necessity for eaxct parallelism of the camera with the original when copying, and getting the copy square and absolutely sharp on the focussing screen. These points have been dealt with in previous articles. If daylight is available for illuminating the original, so much the better, provided the light is distributed evenly over the entire surface. Failing this, artificial light, which may be electric, gas, magnesium ribbon, or even oil lamps, may be employed. In this case, the lights (of which two should be used) are placed at the correct distance on each side of the original to cause equal illumination all over the surface, and in such a position that the light neither shines into the lens of the camera—reflectors behind the lights and a black paper hood round the lens will ensure this—nor is reflected from the surface of the original, which is very likely to occur if it is on glazed "art" paper. This latter point can be easily verified by peering at the original from as near the point of view of the lens as the eyes can be placed.

The question of exposure is one on which it is difficult to give definite advice, as the factors governing it will vary so much with each individual case, and may be from five minutes to half an hour or more, according to the speed of the plate, the stop used, and the intensity of the light. It is well, therefore, to make a series of trial exposures, wasting a plate in the process. This, however, will prove a good guide for future work under similar conditions. The plates should be exposed in sections by pushing in the shutter of the dark slide an inch or so at a time during the exposure, so that each section of the plate obtains twice the exposure of the section preceding it.

The developer that is most favorably indicated for dealing with black-and-white work is hydroquinone. It is essential, however, to make use of this developer at its best, that it should be used at a temperature not lower than 60° F. Below this, it rapidly loses its developing power, and at a low temperature such as 35–40° F. it is practically inert.

A good one-solution formula for line work is:

Hydroquinone	50 gr.
Sodium sulphite cryst.	¾ oz.
Sodium carbonate cryst.	1½ oz.
Potassium bromide	5 gr.
Water to	10 oz.

With a properly exposed slow plate, such as previously described, this developer will be found to give full density, at a temperature of 60° F., in about four minutes, and the plate should come from the developer with the edges, which have been protected by the rabbet of the dark slide, quite clear and white.

An alternative formula, and one that is frequently recommended for line work, is hydroquinone and formalin.

Hydroquinone	65 gr.
Sodium sulphite	3 oz.
Formalin	1½ dr.
Water to	10 oz.

This is a slower-acting developer than the one given above, but will produce even greater density combined with clear lines. After the plate has been fixed, it should, on examination over a brightly lit sheet of white paper, show the black lines of the original as practically clear glass; while the white base should be shown as strongly developed density.

A very slight veiling over the clear lines is generally negligible, but if absolute perfection in this respect is required, these lines can be readily cleared by passing the plate, after it has been fixed and rinsed, through a weak ferricyanide and hypo reducing bath. This will be quite sufficient to clear the lines without materially affecting the density of the other parts. When washed and dried, a negative produced in this way should be capable of giving clean black-and-white lantern slides (which can be developed and cleared, if necessary, in the same manner as that followed in making the negative), or prints, absolutely black and white in character, either by contact or enlargement, can be made on gaslight paper or slow bromide paper.—*Amateur Photographer.*

Notes for Double-transfer Carbon

Waxing solution for flexible temporary should be made of:

Beeswax	1½ oz.
Rosin (colophony)	½ oz.
Turpentine (rectified)	20 oz.
Benzole	10 oz.

The turpentine *must* be free from parafin oil, which is not the case when bought from a shop selling both; the funnels often do duty for both fluids indiscriminately. The film left behind after waxing with the above sets more firmly and quickly than a solution compounded with turpentine only. Waxing solutions should be made up in no less bulk than above, the wax *and* rosin requiring time to dissolve and mix. Both flexible and rigid supports are ready an hour after being waxed with the above.

Rigid supports (opal glass, aluminum, or celluloid) after waxing should be albumenized. The following formula will be found very good:

Dried egg albumen	1 oz.
Bichromate of potash	¼ oz.
Water	40 oz.

The albumen dissolves in a few hours, and will keep good for six months. Dried albumen is better than that from fresh eggs, giving a porous film to which the carbon image clings perfectly; fresh egg albumen gives a smooth film which is wanting in grip.

The albumen should be strained through two thicknesses of muslin into a deep porcelain dish (half-plate), applied to the waxed plate with a flat camel-hair brush, and the plate put on a rack to dry. The rack should stand in a dish to catch the drippings, which may be returned to the stock bottle. Some carbon printers dip the plates into the albumen, but that is very unsatisfactory; the solution soon gets dirty, the plates also get dirty backs, and air-bells are unavoidable on the surface, giving rise to spots of all kinds.

The film of albumen soon dries at the ordinary temperature of the workroom, and the plates are ready for use at once, or they may be stored for any length of time without any deterioration. The albumen film does *not* require any exposure to light to make it insoluble in a quite satisfactory manner. Rigid supports must be albumenized as above previous to each time of using as a temporary support, but do not require rewaxing except at long intervals, say, after being used twenty or thirty times, and if a good drying room is in use they can be used much longer without rewaxing.

Rigid supports of any kind will in time lose some of the matt surface, and yield prints more or less semi-matt, and new plates are not by any means quite perfect as regards surface. These faults can be counteracted by using moistened Carborundum powder (grade F) on a small glass muller with a face about one square inch (broken plate glass makes good mullers), which will speedily produce the desired surface.

The same muller and FF grade Carborundum will turn out very fine focussing screens.

The instructions given with each band, or packet, of double-transfer paper (final support) gives a definite temperature at which the coating is supposed to soften sufficiently for placing upon the image developed on the temporary support, but nowadays there are seldom two batches alike. With some paper the coating melts right off at 75° F., with others prolonged soaking at 150° will fail even to soften the coating.

When sensitizing carbon tissue for the color prints, and drying on a rigid support like plain glass, polished celluloid will be found much more satisfactory: the tissue *never* sticks to celluloid, as it does so often to even the most carefully prepared glass.—*B. J.*

A Stunt Worth Knowing

In photographing against the light it is quite important to shield the lens from light rays which do not form the picture image but which, because of their reflections on the lens surface, spread a veil of fog over the entire negative. Ordinary lens shades often answer the purpose, but for use in the studio the *B. J.* suggests a device which seems much more practical.

A black cardboard mask is placed in front of the lens instead of the card in the vignetter and the opening of the mask is made just large enough and is placed at just the proper distance from the lens to exclude all the rays of light except those which form the picture image.

The mask opening must be of the same proportions as the ground-glass image, and by moving the mask back and forth it is easy to see when it cuts out all the light except that which is necessary to form the picture. Such a mask will insure negatives free from the fog caused by lens reflections.

Milky Fixing-baths

Photographers sometimes have trouble, especially during the warm summer months, with their acid fixing-baths. Their baths become milky, and, as a result, they get brown or yellow spots, and sometimes a brown tone, over the whole surface of their prints. The trouble can be avoided by taking a few precautions.

Prints must be hardened in the fixing bath, and alum is the best hardener. Alum in combination with hypo will release sulphur; but acetic acid and pure sulphite of soda form a gas which prevents the releasing of sulphur and forms a perfectly balanced fixing-bath. If, however, the sulphite contains sulphate, sulphur will be released and the bath will become milky. The same is true of sulphite which has deteriorated through exposure to the air.

When you are sure that your sulphite contains no sulphate, there is still another precaution to take in mixing your acid fixing-bath. Be sure the hypo is thoroughly dissolved before you add the hardener. If any hypo remains undissolved, the addition of the hardener will release sulphur and make the bath milky.

A properly made fixing-bath should never be allowed to get very warm. Even with an unused bath, if it is made very warm, the gas formed by the acetic acid and sulphite of soda will partly escape and allow the sulphur to be released. The simplest and safest way to make up the bath is to have a stock solution of hardener, then, when the hypo is dissolved in the proper quantity of water, it is an easy matter to add the required amount of hardener.

Prints fixed in a milky acid fixing-bath really begin to take on a sulphur tone while fixing. This may not be noticed when the prints are taken from the bath, or while in the washing water, but all the same the toning process has begun and will continue even after the prints have been laid out to dry, especially if the room is warm. The result is prints with brown or yellow spots, and sometimes a brown tone fairly even over the whole surface.

Keep a stock solution of hardener and mix fresh fixing-baths as needed. Do not add the hardener to the hypo until the hypo is thoroughly dissolved, and do not allow it to become warm after it has been mixed. These are all-important.

Of course, you all know that a fixing-bath should not be overworked. Prints will neither be properly fixed nor well hardened in a bath that has had most of the active chemicals worked out of it.—*Professional Photographer.*

Dry Plate Don'ts

Don't immerse the plates in water before development; this is a common source of air-bells.

Don't forget to stir the developer in the tank before immersing the plate; this will prevent pinholes.

Don't expect water to develop a plate, especially when using a tank. It takes a definite quantity of chemicals to produce a good negative, therefore don't dilute the tank developer too much.

Don't forget to use an ample, but not too large, quantity of developer.

Don't practice false economy by trying to use pyro developer for a second batch of plates.

Don't allow the printing paper to get damp or it will result in stained negatives and prints of uneven color which will not tone properly.

Don't permit dishes, graduates, bottles or the work bench to become unclean.

Don't permit dust to settle on the plate; to remove it, grasp it by two edges and tap the edge gently on the table.

Don't become too economical with the fixing-bath; it is cheap, and plenty of it, used fresh, will yield clearer and cleaner results.

Don't dry the negatives where there is any chance of dust settling on them.

Don't lay the blame on the plates for unsatisfactory results until you have made certain that your manipulation is not at fault.

Don't forget to keep the developing tray in motion; this will prevent uneven development and produce a vigorous negative.

Don't use a dusting brush; it collects dust, which in turn is transferred to the plate.

Don't overlook rinsing plates thoroughly after development; because, if you don't, there is every likelihood you will find the negative stained and the fixing-bath discolored, and rendered less effective.

Don't forget to wipe your plate-holders, slides and camera frequently with a damp cloth.

Don't dry negatives in a room that is overheated; this causes melting of the film and increases the density.

Don't withdraw the negatives too quickly from the fixing-bath, or portions of the emulsion will be insufficiently fixed.

Don't allow the solutions to splash on the floor; because, when dry, the chemicals float about the air in minute particles and injure any plate they may fall on.—*Northern Photo. News*

Relief Photography

A PROCESS that would allow, in practice, of obtaining reliefs by means of photography, to the complete exclusion of the work of the art craftsman or modeller, would have a high importance. I shall give in a few words an idea of a new process of this kind which Prof. Namias, of Milan, describes in his latest book, entitled *La Fotografia in Rilievo*, and which is based upon the principle discovered a few decades ago by Poitevin, viz.: A bichromated gelatin coating will, after exposure to light, partly lose its swelling property when immersed in cold water. Thus, if we print a plate having a bichromated gelatin coating under a negative consisting of a scale ranging from black to white, we get in the space which was under the highest action of the light—after immersion in cold water—the least relief, while there will be a gradual increase up to the completely opaque strip which did not allow the light to pass.

Prof. Namias has thoroughly investigated the chemical and artistic conditions which allow the best results to be obtained, and his book gives full details.

The method is a relatively easy one if we only want reliefs from line subjects, but special difficulties have to be overcome if we wish to obtain a relief picture in continuous tone, completely modelled and corrected. We also must premise that in no case can considerable reliefs be obtained, although with the process worked out by Prof. Namias it will be possible to bring out reliefs of some millimeters in depth, while normally we can only obtain fractions of a millimeter. This will naturally limit the applications of the process, and only render it suitable for small work, as in this case even reliefs from one to two millimeters will yield a sensible effect.

If the subject of which we want to obtain a relief is a line subject (I shall not speak here about continuous tones) there will be no difficulty whatever in making a gelatin—and consequently a plaster—relief. We make a negative of great intensity with very transparent lines, and print on to the bichromated gelatin. After the swelling of the gelatin we get the design in intaglio, and on pouring in plaster we get the plaster relief.

It is only necessary to point out that the lines, instead of being flat on the top, like a zinco block, have their surface slightly curved.

This plaster relief now serves as model, which can be used direct as a mould or for obtaining the wax matrices for electrotyping.

In case of designs which represent simple ornamental subjects, it will be advisable to execute these designs directly upon transparent paper, saving thus the trouble of making the negative.

This gives an idea of the vast possibilities of application this process offers, especially in the field of small ornamental metal objects. Besides metal, any fusible material can be used; to mention only fusible enamels which will allow the reproduction of colored decorations in the ceramic industry which will yield a splendid effect.—R. BORN, in *Penrose's Annual.*

Useful Hints for the Line Operator and Etcher

As the war has caused great upsets in all professions, so is photo-engraving affected by the same. Prices of chemicals and material have tripled. Business is not going as usual, and great economy must be exercised to meet expenses.

Our photo-engravers are taxed to the utmost, and the one with the greatest knowledge of the profession is the one most liked.

Bromide, copper and silver solution, being the essentials used in wet-plate and collodion emulsion, have to be substituted by less expensive chemicals.

As all copies are not the best (such as are new drawings), newspaper cuttings or colored and old copies need "cutting" to get good clear negatives. Here is the formula I have used for some time and which gives good results:

Water	6 oz.
Bichloride of mercury	3 dr.
Hydrochloric acid	1 dr.
Sodium chloride	1 dr.
Potassium iodide	1 dr.

Expose, develop, and fix your negative, then soak in the above-mentioned mercury solution.

While your negative is soaking you can expose another, thus saving the time of intensifying the old way. When the second negative is fixed, the first will be ready for the next operation. Now if the negative shows any closed or misty lines, pour over it iodine and iodide solution, cut with cyanide and blacken with sulphide of sodium solution. You get the same results and save bromide and silver solution and time.—*Process Photographer.*

Packing Negatives for Shipment

FREQUENTLY photographs to be used in making halftone illustrations are made by photographers who make very good negatives, but who are not thoroughly familiar with the making of prints suitable for photo-engraving purposes. The prints they furnish sometimes lack important detail shown in the negative. This adds to the expense of the retouching in order to produce desired result. If there is any doubt about the print being suitable, it would be advisable to forward the negative to the photo-engraver.

When ordering negatives that you intend shipping, it would be well to instruct your photographer to use cut films to prevent the risk of breakage in transit. If you must ship glass, you can, by the observance of a few simple precautions, insure a greater degree of safety.

Always make a single compact unit of the glass. Do not place any kind of packing between the negatives, because packing that will give pressure at any point is liable to cause breakage instead of preventing it. Between the negatives lay a single sheet of paper or a clean blotter cut exactly to the size of the glass.

Place underneath and on top of the negatives a perfectly flat one-half inch board cut to the exact size of the negatives. Wrap very tightly with strong paper and tie firmly, or use gummed paper tape. If you use twine, see that the knots are at the edges, so that they cannot press on the flat side of the package. This hard block can be packed in any wooden container with packing to keep it in position and should carry safely.

The negatives, tightly wrapped to prevent shifting, are placed between double-face corrugated board, an opening being cut in each sheet exactly the size of the negative block. These sheets are then cut to the exact size of the wooden box. Several loose sheets are placed in the top and bottom to form a cushion all around the glass. The container should be made of seven-eighth inch board to be free from the danger of other packages crushing during transit.

All packages should be labeled "glass" or "fragile," to insure care in transit and caution in opening.—*Gatchel's Booklet.*

The Process of Photo-Zincography

In the year 1859, Lieut.-General Sir Henry James discovered the art of photo-zincography. This art has since been employed with unequivocal success by Colonial and Foreign Governments. Photo-zincography has, in fact, progressed to a wonderful degree, and no firm undertaking reproduction work can be called up-to-date that has not adopted it. New processes and modifications have from time to time been discovered, and this wonderful method of reproduction appears now to be the most valuable method of its kind in existence. It is now over twenty years since I printed my first half-tone negative direct on to a zinc plate, and transfers were pulled from the same for litho-work.

Experience has taught me that the old formula, *i.e.*:

Albumen (fresh egg) . . .	1 oz.
or dried albumen	70 gr.
Bichromate of ammonia . .	20 gr.
Water	8 oz.

is still the best sensitive solution for direct printing on zinc for photo-zincography. Litho-chalk ink answers well for inking up the plate after exposure, and is easily developed, with a tuft of cotton-wool. I prefer to deal with the cleaned printed plate as follows:

Gum up, fan dry, and, still leaving the gum on the plate, wash out the image with a "doctor," such as a saturated solution of turpentine—litho. crayon parings (or litho. writing ink), 1 oz. of bitumen or asphaltum to the pint. Next sprinkle water over the plate and wash off the gum; then re-charge the work with new printing ink. Washing-out over the gum prevents the work from spreading or thickening, and retains the finest lines clear and sharp, besides protecting the open spaces.

Penrose's process rubber comes in very handy for rubbing out any portions not required.

Gum Etch. The object of a gum etching solution is to fill up the pores of the metal plate with gum; and to prevent it receiving ink, while being charged. The gum etching solution should be of sufficient strength to only just mark the zinc, and must not visibly bite the plate.

The usual solution for this purpose generally contains tannic, gallic and phosphoric acids, in a solution of gum arabic. These chemicals, as well as others, have increased enormously in price owing to the war; I have, therefore, altered my formula to the following:

Gum solution	1 pint
Hydrochloric acid	1 dr.
Nitric acid	1 dr.

After many months in constant use this has proved entirely satisfactory and equally as good as the old expensive formula. I can also recommend:

Chrome alum	½ oz.
Hot water	2½ pints
Gum solution	3 "
Hydrochloric acid	2 dr.

The gum solution in both cases is 1 lb. of gum arabic dissolved in five pints of water.—A. Audy, in *Penrose's Annual.*

The Copying of Photographic Prints

When called upon to copy a photographic print having considerable contrast, most photo-engravers have experienced difficulty in retaining the shadow detail, particularly if the print is of a non-actinic color, such as green or brown. If the difficulty is due only to the non-actinic color of the shadows, it is easy to make the copy by means of a color sensitive plate and an appropriate filter; for example, a Wratten panchromatic plate and a red filter in the case of brown or reddish prints, or a green filter in the case of greenish prints; but if, in addition to its color, the print has very bright high-lights and very dark shadows, it is impossible to retain the detail in the shadows when photographing in the usual manner, and some means must be devised by which the contrast can be lessened. Even if such a prolonged exposure is given that the detail in the high-lights is sacrificed, the shadow detail will still not be properly rendered, and such a prolonged exposure often serves only to make plainer the grain of the paper surface.

In order to reduce the contrast of such prints there is a simple expedient which has proved very successful, and this is to light the print partly by transmitted as well as by reflected light when photographing. This may be accomplished in various ways, but an easy method is to support the print between two clean sheets of glass and to place behind it a white reflector, so that the light from the lamps will fall both on the reflector and also on the surface of the print while the exposure is being made. By adjusting the distance of the reflector from the print, and the position of the lamps, the proportion of light coming through the print to that reflected must be controlled so that the detail required is just sufficiently photographed, since, if too much transmitted light is used, the texture of the paper is apt to be pronounced. To increase the light transmitted the paper can be rendered translucent with castor oil, but it is frequently not permissible to do this, and good results can be obtained without it, even with prints made on heavy weight paper, if the lighting be arranged so that a correct proportion of transmitted light is used.

No exact rule as to the proportion between the transmitted and reflected light can be given as this will depend upon the character of the original and on the nature of the lighting.—Dr. C. E. K. Mees, in *Penrose's Annual.*

Keeping Chemicals

It might be thought that little can be said on the keeping in stock of the chemicals for photographic work. Yet the amateur photographer, and equally the professional or commercial worker employing much larger quantities, would save himself many difficulties by paying more regard than is commonly done to the storage of chemicals. The points most deserving of attention are different in the two cases. But I will endeavor to give some hints which I may hope will be deemed worthy of acting upon.

First of all, to the business photographer, I would give this piece of advice: If in any way possible, have a small room set aside for the storage and weighing out of chemicals. It may be the veriest cupboard, or only a space match-boarded off from some larger room so as to give a floor space of, say, 6 feet by 6 feet. Within such a small space as this a bench can be fitted with the scales and measures for the making up of solutions. Space below the bench allows for the storage of chemicals bought in bulk, such as hypo or sulphite, while the walls can be fitted with narrow shelving to carry the more expensive chemicals and the various odd preparations or solutions which are required, not for regular work, but once in a while, yet need to be somewhere where they can be quickly found. A little room of this kind keeps the main dark-room or other workroom from contamination by chemical dust when weighing out chemicals and making up solutions. It may not do so absolutely, but it goes a very long way indeed toward achieving this desirable end. In the experience of both amateur and professional workers spots and stains are at times a defect on prints and negatives, and often the only possible cause is the deposition in the workroom of chemical dust, such as is easily disseminated from light substances, such as the various developers. The amateur worker usually cannot permit himself the luxury of a separate chemical room, but usually he can use equivalent means of avoiding the use of the dark-room for the purpose. One requires to take a lesson from the manufacturer of dry-plates and papers, by whom the operations of mixing chemical solutions are religiously kept apart from those in which the senstive material is freely exposed.

At the present time, when chemicals are so largely supplied bottled, there is not much occasion to say anything about the receptacles for the various substances. But it is worth while to advise the spending of a little money on proper corks for these bottles. The chemical merchant fits them with the cheapest cork obtainable, the shallow "shive," which has to be dug out of the bottle with some pointed tool, and requires a coating of some sort of wax over it to make a really air-tight seal. Once a bottle so corked has been opened it is practically impossible to use the same cork again and to exclude the air effectively. Far better to lay in stock a decent supply of good corks. They cost "some" money, but they last as long as the bottles remain in use, and they save all the time and trouble requiring to be spent removing the "shives" whenever bottles have to be opened. Not at all a bad substitute are the wide-mouth bottles with metal screw stoppers, now used so largely for the sale of confectionery. If a disc of cork, or practically any soft material, is laid in the cap, screwing down of the latter produces a good sealing of the contents.

Such proper sealing is, of course, not necessary for all the chemicals used in photography. Hypo, for example, keeps quite satisfactorily even when freely exposed to the air, and crystallized carbonate of soda spoils only to the extent of losing some of its water of crystallization, becoming thereby stronger in quality. Crystals of soda show this change by becoming more or less opaque. It is just as well to keep soda excluded from the air, but very little harm is done if it is left freely exposed. But in the case of many other chemicals air has a spoiling effect in several ways. The chemical may absorb moisture from the air to an extent which in many cases may render it liquid, and therefore useless for practical purposes. Then air may affect such substances as sulphite by slowly oxidizing them; and, again, dust in the air may be the cause of deterioration of other chemicals, such as ferricyanide or permanganate. Practically speaking, the chief chemicals which require to be securely bottled as a preventive of their losing strength by absorption of moisture are carbonate of potash, sulphocyanide of ammonium, and the dry or anhydrous forms of soda carbonate and soda sulphite. This is about a complete list of chemicals which are in regular ordinary use. Perhaps I ought to add sulphide of soda, which also readily absorbs moisture. Caustic potash and caustic soda deteriorate to a double extent when exposed to the air—first, by absorbing moisture; and, secondly, by taking up carbon dioxide and thereby being converted, more or less, into the corresponding carbonate. Stick caustic alkali, particularly soda, quickly shows this change by white crust appearing on it.

Too often both commercial and amateur workers are neglectful in the matter of providing permanent labels for containers of chemicals. Where bottles are kept in a dark-room the moist atmosphere speedily loosens paper labels which are stuck on with ordinary paste. It is such an easy matter to make a label practically everlasting that it is well worth taking the job in hand and applying the process to every bottle in the place. A thin paper label is stuck on with ordinary gum or paste and the label gone over with a little size, such as thin glue, or solution of ordinary gelatin. As soon as this is dry (the next day) the labels are given a coating of carriage or "church" varnish, and when this is dry it affords an absolutely lasting protection for the label against damp, or even the more destructive atmosphere of a chemical laboratory.

One or two more points which perhaps may be fresh to some of my readers. It is a good plan, in the case of chemicals which are stored in considerable bulk, like hypo or soda carbonate, to keep a measure along with the material, and thus to save the trouble of weighing out when making up a solution. The measure may be a cup or a glass, or may be made from a P. O. P. tube. It should measure the quantity usually used in making up a formula for fixing-bath or developer, or, if not the full quantity, then one-half or one-quarter of it. Mark it plainly "8 ozs. hypo" or "4 ozs. soda carbonate," as the case may be. For practical purposes such measures are quite accurate enough, so long as the degree of coarseness of the substance does not vary greatly. If one were getting soda carbonate in crystals of pea size, and then suddenly got in a consignment of the mixed form, containing both powder and large crystals like ordinary washing soda, it would obviously be necessary to discard the measure. The measure, in short, is useful and sufficiently accurate so long as the material measured is fairly fine and does not vary greatly in fineness.

The amateur worker, who buys chemicals in small quantities and very often requires to make up a solution in something of a hurry, may perhaps find it of service to keep certain chemicals in stock ready powdered. There are some few substances in the case of which it is useful to do this, for the crystals dissolve comparatively slowly. The chief of these are bichlorid of mercury, potass. metabisulphite, and potassium ferricyanide. Alum is another, but it can be bought in powder. If when you buy your stock you pound it up to a fairly coarse powder with a pestle and mortar, or with a hammer between clean brown paper, it will save you the annoyance of delay on the occasion when you may require quickly to make up some solution.—*B. J.*

The Iron Developer for Black and Sulphide-Toned Bromide Prints

In the preparation of the stock solutions for the ferrous oxalate developer, it is necessary now to say something on the special character of this developer. Ferrous oxalate is totally unlike the organic developers such as metol or amidol. The real developing agent (ferrous oxalate) is a yellowish substance which is almost completely insoluble in water, but dissolves in solution of potass. oxalate. It is formed by mixing the two stock solutions of ferrous sulphate and potass. oxalate in such proportion that there is a considerable excess of the latter. The first practical lesson of these facts is that the iron solution should be added to that of the oxalate, not *vice versa*. It will be readily understood that if you add oxalate to the iron solution, you necessarily have at first a deficiency of oxalate instead of an excess, and that as a consequence some ferrous oxalate may be thrown down and render the mixture muddy. It is a general principle in chemical operations that it is far easier to keep a substance in solution than to dissolve it again when once it has been thrown down. Hence the rule of adding the green iron solution to the oxalate stock when mixing the developer. For the same reason the developer cannot be largely diluted with water in order to render it slower in action. To do so weakens the concentration of the oxalate, with the result that the same kind of muddiness may be produced, if not in the solution itself, at any rate very probably in the substance of the prints. If the developer requires to be made up for slower action it is necessary to secure this result by using a larger proportion of the oxalate stock. A little experiment will show the user more than pages of writing. Take an ounce or two of ferrous sulphate solution, add a very little oxalate stock to it, and note the result.

For the same reason also the print must not be transferred from the developer to ordinary water. This will inevitably cause deposit of yellowish iron compound, which will be particularly noticeable in the white. The prints require to be passed direct from the developer into a weak acid bath, the effect of which is to keep the iron compounds in a soluble state and to allow of their being subsequently washed out before fixing the prints. On this point it is hardly necessary to say that the washing between the treatment with acid and the fixing of the prints is necessary in order to prevent acid being carried into the fixing-bath, since the presence there either of acid or iron is detrimental to the lasting quality of the prints and the purity of the whites. Thus it will be seen that the iron developer calls for several precautions which are altogether foreign to the use of an alkaline developer and entail additional operations. But if the different conditions are borne in mind there is nothing to prevent the prints possessing quality equal, if not superior, to that obtained with alkaline developers in every respect.

Coming now to the practical use of the developer, the working solution is made by adding one part of the ferrous sulphate solution to six parts of oxalate stock, forming a deep orange-colored mixture. It is customary to add a little potassium bromide, although an excess of bromide is to be avoided since it has the tendency to impair the fine black color given by the developer. From 5 to 10 drops of a 10 per cent. potass. bromide solution is an average dose for about 6 ounces of the working developer. It will be found that exposures require to be longer when the oxalate developer is used in comparison with M. Q. or amidol. Probably half as much again or, at the most, double exposure is as much as will ever be necessary; in many cases the additional time will be less than this. The print comes up fairly slowly in the developer—slowly, that is, in comparison with the hasty development largely adopted in the use of the alkaline developers, but with sufficient exposure development will generally be complete under four minutes.

Each print then requires to be transferred directly to the acid bath. This latter consists of a very weak solution of acetic acid, which, generally speaking, is the best acid for the purpose. Citric acid, which also was used years ago is a much more expensive bath. The strength of the acetic bath is 1 part of glacial acetic acid in 200 parts of water, or, roughly, 3 drams of the glacial acid in a Winchester of water. Quite likely present-day bromide papers will stand a stronger acid bath without giving rise to any trouble in the way of frilling. If they can, all the better, since a stronger bath—say, one of 1 : 100—makes for more rapid and complete removal of the iron from the paper. A word may be said here on the glacial acid, which, if of full strength, will crystallize out in the bottle if the temperature falls much below 60° F. This simply shows that the acid is of proper strength; if the bottle be placed for a while in a warm place the contents will become completely fluid.

In working off prints in considerable number the best plan is to use a first acid bath in ample quantity—*e. g.*, an inch or two in depth and in as large a dish as can conveniently be employed. Here the prints can accumulate until the whole lot have been developed, after which they are transferred to a second acetic bath of the same strength and turned over in this for five or ten minutes. They then require to be washed in plain water for fifteen or twenty minutes before being fixed. While a fixing-bath of hypo only may be used, it is, we think, preferable to add also a fair dose of sulphite of soda for the purpose of taking up traces of acid which are carried into the bath in the prints and thus to supply a safeguard against an acid condition of the fixer. Where the fixer is made up with 3 or 4 ounces of hypo for every 20 ounces of water, half an ounce or one ounce of soda sulphite cryst. will be ample for this purpose.

Lastly, it cannot be too emphatically stated that cleanliness of dishes and fingers is of prime importance in the use of the ferrous oxalate developer. Traces of pyro and of other developers in contact with the iron developer give rise to intense dark stains, while ferrous oxalate is also a developer which is extremely susceptible to traces of hypo. The dishes in which development is done should be kept for that purpose alone, and in first taking up the use of the developer it is well to get entirely new dishes for the developing solution itself or to pick out those free from chips or cracks in the porcelain enamel and to make them chemically clean by rinsing with spirits of salt followed by ample washing in water.

In the use of ferrous oxalate it is quite possible that trouble may be met with in the form of blue spots and stains, if we continue the use of the popular bleacher of ferricyanide and bromide. While in theory the acetic acid baths used after the iron developer should remove all iron compounds, in practice they sometimes fail to do so, and though the small amount retained is of no consequence whatever to a black-toned print, it may be enough to give trouble if ferricyanide is applied. The same thing was a source of worry in the old days when uranium toning was in fashion, and the newer developers, such as amidol, received a warm welcome, because with ferrous oxalate one could never be quite certain as to results. Blue spots might appear, or they might not, and if they did the case was hopeless. There is no great difficulty in removing all the iron from a gelatin film, but in a print there is more paper than gelatin, and sometimes certain spots on the paper retain iron with an avidity that defies all the acid baths we can apply. If, therefore, we are obliged to use the iron developer it is obviously safest to give up ferricyanide as a bleacher, or constituent of the bleaching bath.

Another matter for consideration, which unfortunately affects not only the ferricyanide-bromide bath, but also other useful bleachers, is the high price and growing scarcity of potassium bromide. With this salt at the present price of $75 per lb., or its equally useful relation, ammonium bromide, at $72,[1] economy is necessary. There is no adequate substitute for bromide in development, therefore we must keep a supply for that special purpose, and if the stock runs short we cannot afford to waste it unnecessarily on bleaching baths. Iodine is an excellent substitute for the bromide bleacher; its use is, of course, out of the question, both iodine and potassium iodide being required in enormous quantities for war purposes, and having already become almost unobtainable for any others. Obviously, then, for a bleacher we must fall back on a chloride one, and several of these are available.

The first chloride bleacher to consider is the one used for chromium intensification. This ordinarily consists of a mixture in equal parts of a 4 per cent. solution of potassium bichromate with a 2 per cent. solution of hydrochloric acid (that is, two parts of strong acid in 100 parts of water). For sulphide toning a little more acid is desirable, and we may as well keep each solution in 4 per cent. strength and mix equal parts of each when required. If the solutions are not to be kept a long time, we may keep the two mixed together, from the formula: One ounce each of potassium bichromate and of hydrochloric acid in water to make 50 ounces. But if toning is only an intermittent operation, so that the stock solutions may be required to keep for months, the two ingredients keep best separate. An alternative formula, recommended by Mr. Blake-Smith, is the following:

Potass. bichromate	90 gr.
Sulphuric acid	200 min.
Sodium chloride	1 oz.
Water to	10 oz.

After bleaching with either of these formulæ a good washing is desirable before sulphiding. The washing should be continued until all yellow stain has disappeared from the paper.

Another chloride formula strongly recommended by Mr. T. H. Greenall is the following:

A

Hydrochloric acid, B. P., 31.8 per cent.	3 oz.
Water to make	20 oz.

B

Potass. permanganate . . .	40 gr.
Water	20 oz.

To make the working solution, mix in order given: Water, 6 ounces; A, 1 ounce; B, 1 ounce.

---

[1] These are prices at time of writing; they may easily have altered before this article comes before the reader.

This bleacher will not keep in the mixed form, but the separate solutions keep almost indefinitely. It is probably the cheapest bleacher we can use, and though it will generally leave a certain amount of brown stain on the print, this will disappear in the sulphide bath. If it does not do so absolutely the following clearing bath applied after toning will put matters right: Oxalic acid, ½ ounce; water, 50 ounces; with a few crystals of soda sulphite added. It may be noted that a very marked brown stain generally denotes either that the bleacher has been made up in the wrong order or that there is an excess of either A or B.

Here we come to a rather important point. For some reason that is not at all clear many workers fail to get good tones with any chloride process. The permanganate bath is, perhaps, the most reliable of those given, while the bichromate and hydrochloric acid bath often gives bad tones. We can, however, convert any of the chloride images produced into bromide images by simple immersion in a solution of potassium or ammonium bromide, of, say, 5 to 10 per cent. strength; and this is not a very extravagant proceeding, for such a bath will keep almost indefinitely. Mixed baths containing bromide do not keep so well. For example, a bath of ferricanide and bromide may become spoilt by the deterioration of the ferricyanide when the remainder of the bromide, very little of which is used up, has to be thrown away. On the other hand, the simple immersion of a well washed chloride print into a bath of plain bromide does no harm to the solution. A little is lost by absorption in the paper, but a very large number of prints can be treated without materially weakening the bromide contained in the solution; hence a 10 per cent. solution can be used so long as enough of it remains to cover the prints. A solution of an iodide can be used in the same way, but not to the same advantage, as solutions of iodide deteriorate rather rapidly.

We need not say much with regard to the sulphide bath, which can be just the same as ordinarily used. We may, however, point out that the most economical mode of use is to make the solution as required, by simply dropping a few crystals into a vessel of water. Workers on a large scale can safely make up a strong stock solution, of, say, 20 per cent. strength, if they can be sure of using it all up in a week or so, but, however strong the solution may be, its keeping properties are very uncertain after a limited time, and if things go wrong nothing can be done but throw the lot away. There is no real advantage in using a stock solution at all. A toning bath can be made up at any moment by adding a crystal or two to some water, and we need not wait for the whole to dissolve. In our experience a perfectly fresh bath like this can always be relied on to give a good tone.

Workers on a large scale will no doubt be well advised to adopt hypo-alum toning under the conditions we are considering. The use of this method after ferrous oxalate cannot lead to any special troubles, while the results will probably be more satisfactory from the beginning than those obtained with unfamiliar chloride bleachers. Neither is there any particularly valid reason why the smaller workers should not adopt the same method, which is easier, more certain, and far less trouble than most people imagine. Once the bath is in good order the process becomes almost automatic. Another possible process is direct toning with liver of sulphur, but as so many workers apparently fail with this method we hesitate to recommend it farther than to say it is worth trial.

We may add that while there is not much experience available as to the effect of sulphide toning on ferrous oxalate developed images, the use of that developer having been practically abandoned before sulphide toning was introduced, there is not the smallest reason to expect inferior results. On the contrary, we should rather be inclined to anticipate that ferrous oxalate will give an image that is exceptionally well suited to the toning process. Ferrous oxalate was abandoned mainly for reasons of convenience, we might almost say laziness. There was never any question as to quality of result, and generally we may say that it is as good a developer as any in popular use today. It is not at all improbable that after a little experience it will once more become looked upon as one of the best developers.—*B. J.*

Bomide Toning Processes

Most photographer use bromide paper these days, and quite a large proportion of the prints made on this material are toned by one process or another. Now sometimes the toning process used is absolutely the best possible for the conditions under which it is to be used and the results desired, but quite often this is not so. Professionals are very apt to get into a grave and stick there, and whatever toning process was used first is usually carried on with, without much consideration as to whether it is the best for the purpose or not. It is the purport of this article to give brief notes on the principal processes, and indicate for what class of work each is best suited.

We will first take toning processes for the production of sepia tones. There are three main classes: (A) Hypo-alum, (B) bleach-and-sulphide toners in several forms, and (C) liver of sulphur, a little known but most efficient, toner.

Hypo-alum is the best toner of all for quantity production. It is, on the whole, better suited for large batches of cheap or medium class work than for really high-class prints, although with due care beautiful tones may be obtained. Taking it on the whole the tones given by this method are rather inclined to purple. It is almost always necessary to use a hardening bath for the prints to be treated. The toner must be used hot if it is to work in a reasonable time. It appears to reduce prints slightly, especially when newly mixed. It is apt to deposit a scum on the prints, which should be swabbed with cotton-wool, and any fault in the paper base is likely to cause blisters on the prints. These are all its faults, and many of these will not be found of any great disadvantage in practical work. The virtues of hypo-alum are many and great, chief among them being regularity of tone, ease and speed with which large batches may be handled, and economy of cost. It is the cheapest of the sepia toners, and is the one most frequently used by trade printing houses. It should be mentioned that this is the one photographic solution which improves with use.

Our next group—bleach-and-sulphide—is rather complicated by the fact that many different formulæ have been published for obtaining the same result. There is not a lot to choose between them as a rule. They fall under two main heads—bleach of potass. ferricyanide and potass. bromide, and bleach of permanganate, as brought forward by Mr. Greenall. I think the former is the better for general use, as it is more simple to use, but I believe that Mr. Greenall's method scores on the ground of cheapness. The usual formula gives potassium bromide in the bleacher, but it is an advantage both in cost and in the color of the resultant prints to use ammonium bromide in its place. Taking bleach-and-sulphide methods on the whole, the advantages are: Very fine tones, ease in working small or medium size batches, cleanness of results, and the surety that the chemical action is complete, of which latter more later. The disadvantages are the liability of any impurity in the water to cause spots and markings, and the fact that small differences in the time of development of the prints make a big difference to the resultant color.

These are, to my mind, the best processes to use when a fair number of first quality prints are wanted. It should be noted that when these processes are contemplated amidol is the ideal developer, not only for the fine color it gives, but because it does not soften the emulsion of the prints as a developer containing an alkali must do, which is a great score in a process so liable to give blisters as sulphide toning.

There are many variations of these methods. One of the best is to place the print in the sulphide for a few moments before bleaching. They must be washed thoroughly before being proceeded with in the usual way; this gives very rich tones, but it is not easy to get big batches all the same color by this method. Or another useful dodge is to bleach in the usual way, and then darken in pyro developer. The color so obtained is rather a pleasing olive black. The bleached print may be partially darkened in any non-staining developer, and finished with sulphide. Quite a good range of warm blacks may be got in this way, but it is difficult to repeat them. Schlippe's salts may be used in place of sulphide for darkening, but it requires a really first-class original print. Then the tones are good and varied, but unfortunately variable.

The method suggested by Mr. H. W. Bennett, in which bichloride of mercury is used as the bleach, the darkening being done in sulphide, is a most interesting and useful one, but it can hardly be recommended as a commercial process because of the very deadly nature of the bichloride. It is a pity, because for warm black and deep browns the method is unbeatable.

Any sulphide-toned print may be further toned with gold — the usual P. O. P. formula; the results range from warm brown to red chalk. They are most effective, and may be considered permanent.

Our last sepia process is, to my mind, the most beautiful of all, and it is certainly the least known. It is the liver-of-sulphur method. Its advantages are in the beautiful tones it gives, in the fact that it is a one-solution process, so that the change of color may be watched and stopped at the right time. It gives very fine tones on gaslight papers, which with ordinary methods tend to give yellow results. The disadvantages of liver of sulphur is the fact that it is not suited for large quantities. But I think it the ideal process for just a small number of really first-class results.

Now a word as to a most important matter—permanence. Leaving out of consideration the decomposition of the gelatin in which the image is formed, the only change likely to take place in the untoned print, providing it was well fixed and thoroughly washed, is the conversion of the silver image into one of silver sulphide, by exposure to an impure atmosphere. Now this is absolutely the same thing as sulphide toning, only the process may take years to show and never be completed. It is, therefore, obvious that a sulphide-toned print stands a better chance of remaining unchanged than an untoned one, and, further, that the more complete the change the better the chance of absolute permanence. It is here that the bleach processes score, because it is essential that both the bleaching and the darkening shall be thorough if a passable result is to be obtained. In the case of a single solution toner the action may be incomplete, and it may, therefore, continue under bad conditions. It will not cause fading, or even any very marked change in color, but it may be quite enough to make well matched spotting show up very badly.

On the whole, however, one may say that, so far as the image itself is concerned, a sulphide-toned print is unbeatable for permanence among silver images.

These are the processes most likely to find favor, but there are several other methods of toning which may be useful. Foremost among these is copper toning. This is a cheap and convenient toner for colors, from warm black to red chalk. It is used in one solution, so that the extent of toning may be observed and stopped at the right moment. The results of copper toning were at one time thought to be impermanent, but this must have been to a large extent due to careless methods of work. The prints should be at least as permanent as untoned prints.

The ordinary gold-toning bath, as used for P. O. P., may be used on untoned bromide prints, and will give a striking and not unpleasant blue-black effect, which may be found useful for special effects, especially strong lightings. The results are considered fairly permanent.

Uranium toning was at one time a very popular process, and at is still largely used in cheap studios for red chalk tones. It is, unfortunately, a most impermanent method, and its use is not to be recommended except for the cheapest work.

Green tones are best obtained by the use of Mr. H. E. Smith's formula, as given in the *B. J. Almanac*. This is not quite so simple to make up or to use as some formulæ, but the results are fairly permanent, which is more than can be claimed for most green tones. In addition to this, the colors are quite pleasing.

The blue-toner given in the *Almanac* is also about the best for general use, the colors being really good. But, to my mind, when only an occasional print is to be treated, it is far better to buy the blue and green toners in tablet form. In this way the purchase of a number of uncommon and, for other purposes, useless chemicals is avoided, and the solutions may be prepared fresh with the least possible trouble. Of course, if a regular line is to be made of it, it is cheaper to mix your own.

In conclusion, may I suggest that to any photographer of an experimental turn of mind toners offer a wide and interesting field? They may be very profitable, too, for a unique tone is a wonderful "draw" for a studio. Experiments might be made not only in the way of combining known toners, but in the use of new reagents.—Arthur G. Willis in *B. J.*

Photographic Materials and Processes

Papers; Measuring the gloss of photographic ——. K. Kieser. *Z. angew. Chem.*, 1919, 32, 357—359.

The method proposed is based upon the fact that the light reflected from non-metallic surfaces is plane-polarized in proportion to the degree of gloss of the reflecting surface. A suitable instrument is the Martens' polarization-photometer which constitutes the upper portion of the Schmidt and Hænsch densimeter. If the two slits through which the light enters for the estimation of the density or degree of blackening be replaced by a single central opening, the Martens' photometer is converted into a polarimeter, resembling the old Cornu polarimeter. The rotation of the analyzer nicol is the measure of the polarization, and the percentage of polarized light in the total light is proportional to the tangent of the angle of rotation. The light must fall on the surface of the paper at an angle of 56° and the polarimeter must be directed toward the paper also at that angle; the line of demarcation of the two halves of the field of observation of the polarimeter will then lie in the same plane as the incidence of the light. Complete polarization will correspond to a rotation of the analyzer through 45°. The best source of light is an electric incandescence lamp controlled by a variable resistance and provided with a depolarizing matt screen; a dark-room is unnecessary. Papers are always examined undeveloped, washed, and dried; it is very important that they should not be "fogged," since a slight grayness considerably increases the degree of polarization. A slight coloration does not interfere, but with pronounced colors values which are much too high are obtained and the two halves of the observation field are differently colored. Matt gelatin photographic papers give a value of about 10°, highly glazed ones about 30°, which is about the same as that of white enamelled glass. The method is capable of being used for the determination of the gloss of ordinary white papers which show values between 3° and 12°; moreover, it is capable of showing much finer differences than can be detected by an experienced eye.

Colored motion pictures; Method and apparatus for producing ——. W. V. D. Kelley, Brooklyn, N. Y., Assignor to Prizma Inc. U. S. Pat. 1,322,794, 25.11.19. Appl., 12.7.15.

A part of each of a series of motion pictures is obtained by open exposure, *i. e.*, without the interposition of the color-filter which is used for the rest of the picture.

Colored picture; Process and apparatus for production of a ——. J. H. Christensen, Sölleröd, Denmark. Ger. Pat. 313,836, 24.7.18. Int. Conv., 13.8.17.

In a color process in which three color records are taken on one double-coated film and one single-coated film, the two films after completion of the partial color pictures being cemented together, *e. g.*, with glycerin, to form the complete picture, one or both of the coated films is stretched in a special holder in which it remains until the various processes and the cementing are completed. Where two such frames are used registration is secured by an arrangement of pins and sockets, and one (or both) of the frames is provided with a spring edge under the film, in order to assist in obtaining perfect contact of the two films.

Vol. 57. No. 6 June 1920 20 Cents

The Photographic Journal

of America

Smithsonian Institution
JUN 7 1920
National Museum

Published Monthly
With Illustrations

Efficiency in the Printing Room

can never be obtained with make-shift or antiquated equipment. A reliable, scientifically correct, modern printing machine is essential in the production of work of highest quality.

The Ansco 11 x 14 Professional Printing Machine is designed for general use. It is easy to install, economical to maintain and uniformly dependable as to light.

PRICES and full description of this Printer and other Ansco professional apparatus for photographic studios will be mailed on request.

ANSCO COMPANY
BINGHAMTON, N. Y.

New York
129-131 West 22nd St.

San Francisco
171-173 Second St.

Chicago
308 N. Michigan Blvd.

Toronto
347 Adelaide St., W.

THE PHOTOGRAPHIC JOURNAL *of* AMERICA

REGISTERED IN THE UNITED STATES PATENT OFFICE

NEW SERIES: WILSON'S PHOTOGRAPHIC MAGAZINE

AN ILLUSTRATED MONTHLY DEVOTED TO THE SCIENCE AND ART OF PHOTOGRAPHY

THE OLDEST PHOTOGRAPHIC MAGAZINE IN AMERICA
Founded 1864

Incorporating:
The Philadelphia Photographer **The Photographic World**

THOMAS COKE WATKINS, Editor

CONTENTS FOR JUNE, 1920

Balance and Harmony in Portraiture . . . . "Professional" 211
Pinhole Exposure Calculations . . . . Edward B. Mallory 215
Practical Advertising—A Straight Talk 219
Editor's Table—Getting Your Price—The True Value of Conventions 223
The Studio—Practical Papers on Studio Work and Methods 225
Views and Reviews 230
The Workroom 235

YEARLY SUBSCRIPTION, in advance, postage paid, United States, Mexico, Cuba, Philippines and Porto Rico, $2.00; Canada, $2.35. Countries in the Postal Union, $2.75. Single copies, 20 cents.

REMITTANCES may be made at our risk by money order, check, draft, or registered letter.

SUBSCRIPTIONS begin with current issue.

Published by EDWARD L. WILSON COMPANY, INC.,
THOS. C. WATKINS, President. 701 Arch Street, Philadelphia, Pa.
EXECUTIVE and EDITORIAL OFFICES, CAMERA BUILDING, 122 EAST 25th ST., NEW YORK CITY
HOUGHTON'S, Ltd., London, Eng., Agents for Great Britain
American News Co., Distributors for U S. Kodak Australasia Ltd., Sydney, Agents for Australia
RICHARD HILL, Devonport, Auckland, Agent for New Zealand

Entered at Philadelphia Post-office as Second-class Matter

This is one of a series of sketches on Leading American Photographers

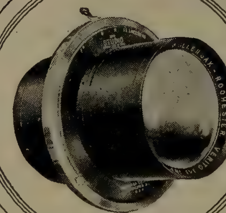
American Photographers

EDWARD WESTON:—We know of no one who has contributed more to the progress of pictorial photography than Edward Weston of Glendale, California, a member of the Pittsburg and London Salons of Photography, whose exhibits have been of such merit that they have called forth favorable comment the world over.

It is difficult to describe by mere words the subtle charm and delicate elusiveness of Mr. Weston's work. The distinctive lighting effects and the atmospheric quality that Mr. Weston obtains makes a signature hardly necessary in order to indentify his prints as Weston masterpieces.

Perhaps the fact that the Verito F:4 renders a beautiful softness without distracting "fuzziness" or "halo" induced Mr. Weston to select this as the lens best adapted to his particular needs. No matter what lens you are now using, your studio is really not complete without a Verito, which makes portraiture not only more pleasurable but more profitable as well.

Our catalog describing the Verito and our other products will be sent you gratis on request.



Here is a portrait of Edward Weston by Margrethe Mather and a reproduction of the Verito Diffused Focus F:4 lens that helped to make him famous.

WOLLENSAK OPTICAL CO.

ROCHESTER, NEW YORK.

$100.00

DEPOSITED IN A NEW YORK BANK, WILL BE PAID THE EXPERT NEGATIVE RETOUCHER THAT CAN RETOUCH A NEGATIVE WITH A STIPPLED EFFECT, EQUAL IN FINENESS, SMOOTHNESS AND REGULARITY AS IS DONE BY THE

ARTOGRAPH
TRADE MARK.

SCREEN

Pat. Pending

THE LATEST AND GREATEST LABOR-SAVING DEVICE.

For Professionals. :-: For Amateurs.

NO Time—NO Skill Required.

IF YOU WANT TO SAVE MONEY AND PRODUCE SUPERIOR WORK

SEND FOR ONE TODAY!

Endorsed by Sarony and other high-class photographers.

Sent on receipt of price: 5 x 7, $3.50; 8 x 10, $5.00

The Artograph Screen Co.
500 Fifth Avenue New York City

For Sample Photo send 15¢ in stamps

Sent Complete with Combination Pink Films that Produce Results

---

HEYDE'S ACTINO PHOTO-METER

Eliminates Guessing in Photography!!

The simplest, most effective and most accurate instrument for determining correct time for exposure.

Easily and quickly manipulated; compact and always ready for use.

No Sensitive Paper Used For Tinting

Exposure table complete on dial.

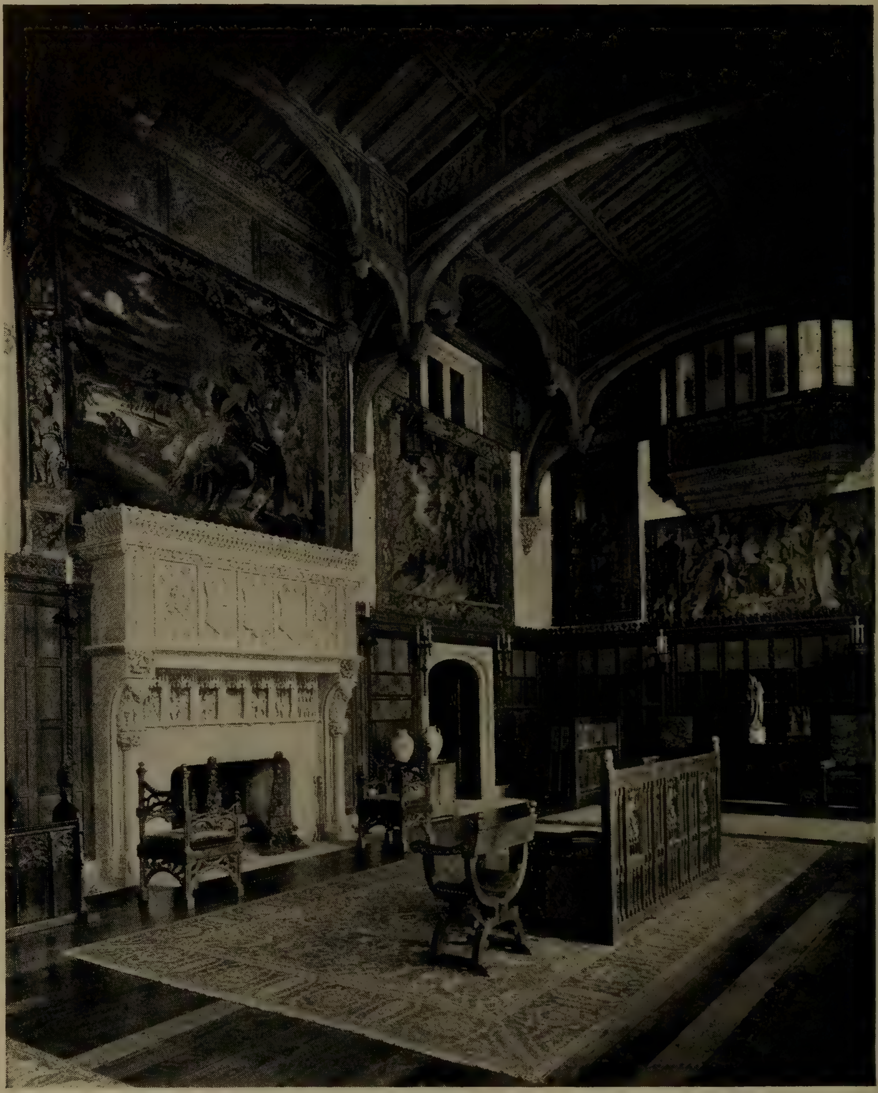
Essential to the Photographer who wants perfect pictures.

Order by mail or from your dealer. Write for descriptive booklet.

New Vest Pocket Model
Size Dia. 2-3/8" x 13/16" Thick
Price $10.

Dealers: A postal will bring our special offer.

HERBERT & HUESGEN CO.
18 East 42nd. Street
NEAR 5TH AVE., NEW YORK.



BY MATTIE EDWARDS HEWITT
NEW YORK CITY

The
PHOTOGRAPHIC
JOURNAL
of AMERICA

VOLUME LVII JUNE, 1920 NUMBER 6

BALANCE AND HARMONY IN PORTRAITURE

By "PROFESSIONAL"

THE best lines in the head and neck of a lady sitter are largely determined by intuition on the part of the operator. They must be found by turning the head in different positions and studying the effect in each. These lines, when correct, appeal to the æsthetic sense of the operator, and greatly influence the dignity of pose and sweetness of expression. It is sometimes advisable to be satisfied with the simpler Hogarth line of beauty, rather than to strive for the "S" line, if in so doing a discordant note in the perfect representation of the character of the sitter be struck.

The bending of the head, which is sometimes necessary to complete the extension of the "S" line, is frequently disastrous. If persisted in, even to a slight degree, without proper discrimination, it may change the portrait of a lady of refinement into the picture of a bold, coarse woman. Is it not true that in such a case as this the arrangement of line in the simple turn of the head emphasizes qualities that are often overlooked? Do not of necessity conclude, if a critical subject says her pictures do not resemble her, that she is either of necessity a crank or wrong in her belief. It does not always follow that because the lens will photograph the wart upon my lady's nose so faithfully, that these pictures showing this characteristic must of necessity look like her. You may simply have used wrong lines in the pose of the head, with the result that the portrait reflects her features in a manner unfamiliar either to herself or friends in daily life.

In addition to the face, the lines which form the hands may indicate coarseness, aggressiveness, daintiness, or other characteristics. "Art is beauty in some form or other, and the aim of art is to find and show this beauty." The hands have an important mission to perform in portraiture. The manner in which the fingers are interlaced, or the drapery held, etc., has much to do with the expression of beauty and character. It frequently will be found that the hands should show but slightly, if at all, particularly if not well formed and attractive. If shown, they should be in keeping with the personality of the subject. If efforts are made to show these characteristics in the portraits of the dainty, well-bred lady, do not fail to give the same attention to other characteristics of the figure, no matter how minor they may be.

Great importance attaches to the special training of the finishing schools for young women. In these schools are taught the principles of carriage and the art of walking, standing, and sitting with grace and ease. These matters are considered important in the school of society and should be recognized in the studio. Whenever evidences of this special training are apparent, it will usually be found advisable in photographing the sitter to allow her to pose herself. Such a pose will probably be more characteristic than the result of your attempt at arrangement. In cases where through diffidence or other reasons the sitter is unable to take a position both characteristic and artistic, a few simple suggestions may often accomplish the end desired.

I would add, in passing, that this method is the one most generally satisfactory in all posing, whether of men, women, or children, whenever it is possible to employ it. Its advantages are most important, however, in the posing of the head or bust.

All arrangement of the dress and drapery that can be properly left to the photographer should be attended to by him, particularly in the case of lady sitters. He should endeavor to accomplish results without ever touching the face of his sitter, and seldom the head. When necessary, however, the touch should be upon the top or back of the head, and never in front of the ears. Your sitter will mentally, at least, thank you for this delicate attention. We are not barbers, neither should we give our patrons the impression that we are akin to them.

In the general arrangement, all lines (except under certain well-understood conditions) should aim to give grace. This rule applies even to those lines that are mainly employed for the purpose of balance. By this we do not mean that curved lines only should be used. There is no greater aid to the expression of force and elegance in curved lines than the judicious employment of straight lines, by which their monotony is broken. Straight lines are, therefore, often very properly used in the treatment of backgrounds and lower parts of the picture.

Occasion may arise when curved lines, in connection with which are associated grace, beauty, delicacy, daintiness, etc., could be dispensed with, and abrupt, angular, and even proportionate strong "Z" lines substituted. The natural tendencies apparent in the make-up of individual sitters readily suggest the character of lines suitable to be employed. Care should be exercised in the employment of these lines that they be not too forceful. They must not dominate the sentiment, but support it. The student will find ample and excellent material in any good reproductions of the successful paintings of any age in art, for the study of lines and the power they possess in the interpretation of character.

As a general rule, or so it seems to the writer, straight lines, when employed in a composition, may, like salt upon partly seasoned food, be used sparingly. This applies to intensity of tone and size of line as well as number. When they appear in accessories, as, for instance, in a table or chair, to form a decided angle in strong tone effect, they may be modified by changing the position of the accessory or, as in the case of the table, by breaking the long and strong line of the edge by projecting something like a book over it, thus causing smaller counter-lines in other directions. It may also be assisted and always should be, if pictorial effects are studied, by a suitable background and subordination. Straight lines possess great strength of attraction, necessitating much more attention than the same tone qualities in curved ones.

The outside line of the figure, to cite a single instance, should always receive special treatment, that it may be symmetrical and merge or melt into the ground to some extent. This may be done by lighting the too prominent outline of the figure in a lower key, and by arranging the background at that part so that it too will be approximately of the same tone as that of the figure. This applies equally to the standing figure and the bust portrait. Lines should diminish in their power of attraction as they recede from the central point of interest, whether they are curved or straight.

Avoid undue repetition of lines of equal size and weight when in close proximity to each other. If not large nor too prominent, which may be the case if in a low key, they are quite harmless. If there be a multiplicity of them, however, and it be impracticable to change the arrangement of the composition, which is otherwise good, or even pleasing, do not mind them at this stage, but stick to the greater thing, and carry your scheme through. In one of Sir Joshua Reynolds' lectures to his students he makes a point which is quite applicable in this case. Its sense is to the effect that it is much better to be an inferior artist of the *grand style*, than a better grade artist of an inferior style, and that too much attention to petty and unimportant details with a loss of grandeur and style in the conception itself is a thing that should be guarded against. It is well at this time to recall this sentiment, lest we, in our efforts to apply art principles to our productions, stultify ourselves by undue attention to the lesser things. If we try to produce balance, rhythm, and harmony, their importance being in the order given, and keep this idea ever before us, an occasional lapse in less important principles will not prevent our work from doing us great credit. Worthy ambition and high ideals are much to be desired, and the goal which Reynolds advises his students to strive for is applicable to us as photographers.

In the instance above cited referring to the multiplicity of unimportant lines, if the advice to disregard them for the time being be adopted, their subsequent treatment may be effected and any undue importance modified by etching or rubbing out the most noticeable ones, thus relevating that part of the negative to the character of a mass or spot of proper tone, so that it will not in turn possess undue attraction. Of course, the changing of the character of this part of the negative and its relation to the whole has to be considered, but the composition is frequently improved in an æsthetic sense by this loss of detail and the gain of mystery and simplicity. If these lines are large and of equal size, they are likely to be very damaging and should receive careful attention. They should be subordinated in a mass of shadow to come at this place, or merged into some adjacent object, such as foreground, background or accessory of about the same tone. The composition is also improved by diverging balancing lines. The employment of some or all of these methods will be found to answer the purpose. The darker the lines, the more do they attract attention, especially if aided by contrasts, the effect being more noticeable as they increase in size. It is possible in arrangement to avoid this repetition in size of pronounced lines, and the difficulty of removing them is best obviated by care in arranging the composition. Unequal spaces between lines, unequal sizes of lines, and a breaking of their exact regularity in direction, does away with any damage that could result from their use. This applies whether they are straight or curved.

There seems to be a general understanding among photographers that parallel lines should always be avoided. Perhaps if slavishly used, this may be the case. There are occasions, however, when lines that appear parallel really do no particular harm in the picture. This, like many other things, depends upon the prominence they possess. If pronounced, they are hurtful and should be differently arranged. It is a mistake to think that lines that closely approach the parallel may never appear. They may often be used to advantage. A good thing to guide you is your sense of feeling which you are constantly training. If the lines distress you, change them till they no longer annoy you.

A lady's hands may be simply clasped in her lap, very nearly approaching the parallel, yet they certainly add repose, and are much in keeping with many types of the feminine face. If they do not jar upon your sensibilities and the picture sense of quietude and simplicity is well interpreted by their presence, do not let this use of them prevent you from making the picture.

Without entering into a discussion at this time as to the "Silhouette" itself, I would mention that the greatest objection that has been raised by artists and critics to this picture is in the sharp and hard outlines formed against the background, more noticeable as the contrast is increased. Principles that are applicable will come under discussion later in these papers.

These lines as an aid to "concentration of interest" are more likely to act inversely and by their prominence draw attention from the pleasing things of the face or head to outlines which are often unpleasant. This is noticeably the case at times in the profiles of ladies, in the line from the chin down the neck and along the shoulder. The remedy is obvious. Grade the shade of the ground and light the face so that the excessive contrast is not so apparent. It will frequently be found advisable to change the scheme or usual method of lighting to obtain the desired result, and to employ the broad light in its full sense, which will remove the difficulty. Posing, the subject facing the light, the camera, itself, being backed up to the side light, permits the attainment of results not possible under other conditions. By slightly turning the figure, moving the camera up or down and alongside the side light, and placing the subject nearer or farther away from the light, will enable the photographer to obtain any effect of brilliancy, roundness, tone and color values, although at first thought only flatness would result. The lighting is very subtle and picturesque. In connection with the above, several tints of graded grounds on curtain rollers, that can be raised or lowered, will work in well, and all undue prominence of these lines in the silhouette may be remedied.

Rhythm of direction in the general tendency of important lines leading to or adjacent to the principal parts of the picture, and inclining as a whole toward the center of interest in the composition is important. As rhythm is the graceful carrying out of some form of motion, it is apparent that good rhythm will increase movement, and movement gives life to what may otherwise be an inert mass of unattractive lines. As interest is thus gained by this movement, only attainable by rhythm, it at once becomes apparent that the beauty of a portrait is much enhanced by this treatment, and the principle is of great value, to be understood and striven for by us all. Breach of rhythm is caused by lines running contrary to a general direction, which are impossible of union, and the breach becomes greater as the number and size of these lines increase.

One of the first things the student in photography hears in commencing "posing" is the much quoted phrase, "If you have a straight line here, have another one next, going the other way, to balance it," thus giving the impression that this must be slavishly followed. If this erroneous advice were literally followed, we would have most peculiar compositions, in fact grotesque, and rhythm and harmony would become impossibilities.

It must not be supposed, however, that all lines should run in exactly similar directions in the groups mentioned above, where they appear hurtful to the composition.

Among other things, monotonous effects have to be guarded against. Better composition is obtained if the general tendency is in this direction, and where slightly diverging lines run in and join other lines let their union be softened and practically lost, rather felt as joining than positively indicated.

The reader will recall many of the pictures of flower pieces where this theory is carried out, and he may view the decorative school of Japanese art with much profit in this sense. In the practice of photography avoid the use of small stops in lenses and light the subject either away from the strongest light, or screened by curtains, with a view to accomplishing this result while striving for color and tone values, atmosphere, and the like. In the arrangement these lines may receive attention and be made to melt in together and not brought into sharp outline against each other. Furthermore, recourse may be had to the various methods photographers now employ to remedy defects in the negative or print. A remedy for this and other difficulties is also possible by printing under transparent films imposed between the negative and paper. Vertical lines add dignity, horizontal lines repose, diagonal and opposing lines action.

PINHOLE EXPOSURE CALCULATIONS

By EDWARD B. MALLORY

IN the early days of the electric light, before the advent of photometers, illuminometers and other instruments of precision, it was customary for manufacturers to gauge the candle-power of incandescent lamps by mounting them on the ceiling of a high room, the walls and ceiling of which were painted a dead black, with no windows or openings to admit extraneous light. A human photometer, previously blindfolded to accustom the eyes to uniform darkness, was led into the room and the blindfold removed. By comparing the newly manufactured lamps with certain others, known as "standards," he spotted the various lamps of the same apparent brilliancy, the corresponding "candle-power" being marked on the lamps and the lamps sold according to this rating. In this day of highly developed photometers, capable of measuring illuminants and illumination with mathematical precision, it is quite evident that the human eye could hardly be expected to even approach the accuracy of the crudest photometer.

While physicists in general and the lens-makers in their laboratories have reduced lens design to an exact science, and the laboratories of the negative makers have largely succeeded in putting the "experience in the tank," yet photography as a science is, in many ways, about at the same state of the art as that occupied by the electrical industry in the days of the blindfolded "photometer"; at least a reader of current photographic literature would get this impression from the multitude of inaccurate and misleading statements published for the perusal and intended education of the followers of the art.

The relatively great latitude of plates, films, printing papers and reducing agents (developers), and the lack of accurate measuring instruments, is doubtless largely responsible for many inaccuracies as well as for the limited research work done in this country independent of the manufacturers. Everyone seems content to accept the art at its present state of development and leave technical worries to the manufacturers and posterity.

The efforts of the editors of photographic magazines to publish the results of practice and experiments by students of the art is heartily endorsed by all serious workers, but it is contended that authors of technical articles should exert every effort to reduce the findings and resultant theories to accurate dimensions as a step in the right direction in anticipation of the time when photography can rightfully be classed as an exact science.

It is not the intent or purpose of this discussion of the subject to criticise the findings or opinions of others. Figures and statements quoted herein, from published articles by other authors, are incorporated entirely for purposes of comparison by analysis, as the tyro undertaking pinhole photography can find as many values for calculating his exposures as there are authors on the subject.

Pinhole photography has been the subject of considerable experiment and investigation by the author, occasioned by failure at the outset to obtain satisfactory results by following the instructions supplied with a so-called "pinhole lens." The results of these early attempts led to a comparison of the values of pinholes as advocated by various authors, the relation between pinhole and lens apertures, and an analysis of the various factors involved. For purposes of illustration the comparisons in this discussion will be confined to the values advocated by Dr. D'Arcy Power and Mr. Alfred Watkins, apparently the most comprehensive writers on the subject.

Before undertaking the comparisons it is necessary that the formula for calculating the *f* value of any pinhole be understood. The following formula may have been used by earlier authors, but diligent search in published data on this subject failed to disclose a formula for calculating the *f* value of any pinhole, regardless of diameter; necessitating the construction of a formula applicable to all cases.

FORMULA 1

$$\frac{\frac{1}{d} \times K}{60} \times L = f \text{ value at 60 times lens exposure at equivalent } f \text{ value.}$$

wherein d = diameter of pinhole in inches.
L = distance from pinhole to negative in inches.
K = a factor varying with the ratings of various authors.

As modern exposure meters do not include *f* values of the actual proportions of those of the pinhole it becomes necessary and convenient to read the exposure in minutes or fractions of minutes instead of seconds or fractions thereof, the above formula providing *f* values accordingly.

Dr. D'Arcy Power, in *Photo-Miniature*, No. 70, has published what is probably the most interesting and instructive work on this subject, and full credit for reducing pinhole factors to some convenient workable basis should attend this work. It is contended, however, that exposures crowding the permissible minimum would result if very fast plates with small latitude were used, as will be evident from an analysis of his factors. The following table of pinhole sizes and corresponding factors, which, multiplied by the focal length, give the *f* values of the pinholes, is set forth by Dr. Power. For purposes of later comparisons the column giving the corresponding diameters in inches has been added:

TABLE 1

Pinhole number.	Diameter in millimeters.	Diameter in inches.
1	1.00	0.0394
2	0.75	0.0295
3	0.50	0.0193
4	0.375	0.0147

The use of the table is illustrated as follows: To take a certain landscape, No. 2 pinhole is selected, and 8-inch focal length is required. Accordingly, we have 2 × 8 = 16, the *f* value of the pinhole in this case, or if a lens at *f* 16 would require one-half second exposure, with the pinhole it would require one-half minute. In the text it is stated that, "Starting with the millimeter hole as No. 1, the rest diminish in such ratio that each passes half the light of the preceding." Do they according to the table?

In the first analysis let us take, for example, No. 1 and No. 2 pinholes. As the light passed by an aperture is proportional to the square of the diameter, we have $\frac{.75^2}{1^2} = 0.563$ and not 0.5 as stated, or by reversing the formula we have $\sqrt{\frac{1}{2}}{}^{2} = 0.707$, or to pass half the light of hole No. 1 the diameter of hole No. 2 should be 0.707 mm.; similarly, hole No. 4 should be 0.353 mm.

Dr. Power gives, as the basis of his conclusions, an experiment in which a lens of 10½-inch focal length at *f* 32 exposed one second gave a negative identical (to the eye) to that obtained at the same time with a pinhole 0.45 mm. diameter exposed one minute, which expressed as an equation would be:

Lens.		Pinhole.
10.5 in. focal length 11 in. from negative 32 *f* value 1 sec. exposure	=	.45 mm. diameter 11 in. from negative 60 sec. exposure.

Reducing the apparent lens values to the effective values, $\frac{10.5}{32} = 0.328$, effective diameter of the lens opening in inches and $\frac{11}{0.328} = 33.5$ effective f value. Reducing the pinhole aperture to inches and expressing the effective f value, $\frac{0.45}{25.4} = 0.01772$, diameter of pinhole in inches and $\frac{11}{0.01772} = 621.5$, effective f value. Therefore the equation becomes

$$\begin{array}{lcl}\text{Lens.} & & \text{Pinhole.}\\ \left.\begin{array}{l}\text{.328 in. diameter}\\ \text{1 second exposure}\end{array}\right\} & = & \left\{\begin{array}{l}\text{.01772 in. diameter}\\ \text{60 sec. exposure}\end{array}\right.\end{array}$$

or $\sqrt{.01772^2 \times 60} = 0.137$ inch, diameter of pinhole at equivalent exposure of one second; therefore:

Lens .328 inch diameter = pinhole 0.137 inch diameter,

or in the ratio of $\left(\frac{328}{137}\right)^2 = 5.72$, or the lens area is over five times the pinhole area at equivalent exposure. Allowing a diffraction factor of most generous proportion the analysis would still indicate an absorption factor of considerably over 50 per cent. in the lens, which would hardly seem compatible with modern lens performance.

Now let us take the "Watkins" factors as published in the Watkins *Manual*. A table differing materially from that given by Dr. Power is given, with a rule governing its use similar to the rule given by Dr. Power:

TABLE 2

Watkins Power No.	Diameter in inches.
3	0.053
4	0.040
5	0.032
6	0.027
7	0.023
8	0.020
10	0.016
12	0.013

To compare by analysis with the factors given by Dr. Power it is necessary to reduce to an equivalent basis. By applying Formula 1 we find that K, according to the Watkins factors, would be 10, and by reversing the formula and adopting the Watkins factor for K we have

$$\frac{1}{\dfrac{\frac{32}{11} \times 60}{10}} = 0.0573$$

or the diameter of a pinhole rated at $f/32$ at 11-inch focal length, according to Watkins, would be 0.0573 inch.

Expressing the comparison with the lens used by Dr. Power in an equation we have:

$$\begin{array}{lcl}\text{Lens.} & & \text{Pinhole.}\\ \left.\begin{array}{l}\text{.328 in. diameter}\\ \text{1 sec. exposure}\end{array}\right\} & = & \left\{\begin{array}{l}\text{.0573 in. diameter}\\ \text{60 sec. exposure}\end{array}\right.\end{array}$$

or $\sqrt{0.0573^2 \times 60} = 0.443$, diameter of pinhole at one second exposure, then lens 0.328 inch diameter = pinhole 0.443 inch, or in the ratio of $\left(\frac{.328}{.443}\right)^2 = .55$, or the lens area is slightly over one-half the area of the pinhole at equivalent exposure. It is contended that no known phenomena or factors incident to lens and small aperture performance would justify this relation.

We have found that Dr. Powers rates his pinholes as of one-fifth the area of a lens at equivalent exposure time and that the Watkins rating is twice the area of the lens. Reducing this discrepancy to exact figures for comparison, we have, $\frac{5.72}{.55} = 10.4$, or a Watkins pinhole would be ten times the area of a pinhole according to Dr. Power, at the same focal length and exposure time. As light admitted is proportional to the area of the aperture, it follows that a negative exposed according to Watkins would get ten times the exposure of one exposed according to Dr. Power; yet exposure in either case would produce a printable negative, a decided tribute to the latitude of modern plates and films.

Apropos of the remarks in the introductory paragraphs, as an illustration of the manner in which inaccurate data is read and passed on, a writer in the *American Annual of Photography* for 1920 quotes Dr. Power and repeats the assertion that an aperture 0.75 mm. in diameter will pass half the light admitted by an aperture 1 mm. in diameter. While the actual difference between the true and stated values could not be determined by the blindfolded photometer method, yet it represents a retarding factor in the development of the art toward that point where it will become an exact science.

While it may seem to complicate matters further to add additional factors to the variety now available for determining pinhole exposure time, if we should stop at this point, without adding constructive data, the reader would doubtless be in the same frame of mind as the author at the beginning of his investigations—ready either to drop the subject as too indefinite to ensure satisfactory results, or determine by analysis and experiment the proper method of procedure.

At the outset a definite mathematical relation between the pinhole and the lens was sought. To elaborate on the various intermediate steps in the calculations would be of little value, as they involved, largely, known physical facts; it being sufficient to assign a value to K, in Formula 1, to make it adaptable to all pinholes. This value, neglecting a vulgar fraction, is 6—Formula 1 becoming:

$$\frac{\frac{1}{d} \times 6}{60} \times L = f \text{ value at 60 times equivalent lens exposure.}$$

or to simplify for convenience,

$$\frac{1 \times L}{d \times 10} = f \text{ value}$$

In the absence of access to a complete physical laboratory, this value was confirmed experimentally under conditions obtaining in practice by securing a case of plates of one emulsion, using a reducing agent obtained in one quantity, developing all negatives at uniform time and temperature and preserving all other factors uniform except the varying exposures. That this method of confirming calculations is likewise subject to criticism, as being in the "blindfolded photometer" class is admitted, yet as the factor given represents a mathematical relation between the lens and pinhole (ratio of 10:11), taking into consideration the loss of effective light due to diffraction and diffusion in the pinhole and factors modified by reflection, refraction, ratio of actual to effective aperture, and various other phenomena peculiar to lenses; it is submitted as a standard of performance, capable, when properly applied, of producing negatives closely approaching, if not actually at, the center of the flat portion of the curve of density. It must be remembered, however, that as this rating does represent a definite relation between the lens and pinhole, the same allowances for distance and photographic character of the subject must be made exactly as though a lens were employed.

For convenience in the field, after the exact diameter of pinholes have been determined, it will be apparent from the formula that a constant (f value at unit focal length), or what the authors quoted herein term the hole number, may be obtained by the portion of Formula 1, $\frac{1}{d \times 10}$, it then being necessary to simply multiply the focal length in each case by this constant to obtain the f value. If hole diameters are determined in millimeters it is easier to reduce to inches by dividing the value in millimeters by 25.4 to obtain the diameter in inches and apply the formula as given rather than to try to remember two values for the factor K in the formula. Should negatives indicate underexposure or undue diffusion, examine the pinhole under a powerful microscope; the appearance will doubtless be quite surprising.

For readers provided with the "Watkins Pinhole Lens," sold in this country by Burke & James, the following corrections are offered:

TABLE 3

W. P. No.	Diameter. in inches.	Corrected (M) No.
3 . . .	0.053	1.9–2 for convenience
6 . . .	0.027	3.7–4 " "
8 . . .	0.020	5.0–5 " "
10 . . .	0.016	6.2–6 " "
12 . . .	0.013	7.7–8 " "

In this country, where the production of photographic supplies is largely controlled by one interest, the representatives of which advise that "It is im-practical to give the relative speeds of plates," it would seem that the old adage, "Where ignorance is bliss 'tis folly to be wise," is largely capitalized. Yet if a second comparison with another industry may be permitted, the liberal education of the public in the use and possibilities of electricity has resulted in extending its use quite materially, even to the home to wash and iron clothes, wash dishes, clean rugs and carpets, cook food, regulate the furnace, curl milady's hair, heat rooms, light cigars and do a host of other things too numerous to mention, with a consequent broadening of the field for sales, for the manufacturers who provided the education.

It is suggested, in conclusion, that an independent physical testing laboratory for examinations, ratings and general photographic research work, preferably operated under the auspices of some prominent photographic society, would result in greater strides in an art that is not keeping pace with its fellows, due very largely to lack of dissemination of accurate knowledge.

PRACTICAL ADVERTISING

A STRAIGHT TALK

FELLOW-PHOTOGRAPHER, do you want more business? Want to be more than a plodder? Want to get out of a rut? Want a good, thriving trade that will require your spare energy and extra help to handle? Then do some sensible advertising through your newspapers. Printer's ink is the power that moves all business these days of keen competition, and photography as a money-making business will get a new lease of life if treated with printer's ink in liberal doses!

Newspaper advertising for photographers is a deplorably neglected field. First, because the majority of photographers are brought up to believe they must never stoop to common, commercial advertising to push trade. Second, because ninety-nine out of a hundred can't write the right kind of ads that bring business. Something fancy, fussy or feverish is generally the product of their pains. Not that their efforts are not sincere; but it takes study, training and ability along this peculiar line to write successful, business-bringing ads.

A little jolly froth dashed off won't do. Sounds smart to the office, perhaps, but lacks the seasoning of solid sense—the pulling power to any ad.

Don't think that, because old liners and timers have always cried, "Don't use printer's ink," it is contrary to art and lowers the tone of the profession." Nonsense! Boys, wake up! There is a raft of business all around you, and it can be brought your way with proper advertising.

For years stockdealers have proclaimed from the house-top, "You must get such and such a camera; so-and-so's lens; this and that background, etc., if you would do business." All good advice, as far as it goes. Certainly, get the best tools to be had. Make good work, learn how or hire some one who can, and then—advertise!

It is estimated by expert authority that twice the trade in photography can be secured by proper newspaper and booklet advertising.

Why not? Is photography so radically different from other business that it needs no publicity?

Don't you know that even churches are driving in volumes of business with bright, newsy ads, changed often, which a short time ago was considered a sacrilege to their profession.

Now, it is granted that you are up to date in equipment; that you have fresh attractive prints; that your cases are

BY MATTIE EDWARDS HEWITT NEW YORK CITY

changed often and your help competent and courteous. From such you are sure to attract a certain share of trade. But mark how many more pictures will be made and shown, your name on every tongue and your studio a household word, if you advertise!

Do you suppose for a moment the respectable dry goods concerns, hardware men, druggists, etc., sit still and depend just on the customers that drift in, simply attracted by a pretty window display and occasional praise from their customers? Not any! They are moving every faculty to develop fresh, newsy advertising. They know their business thoroughly. Know they won't have much business—a mere existence—if they don't spread printer's ink!

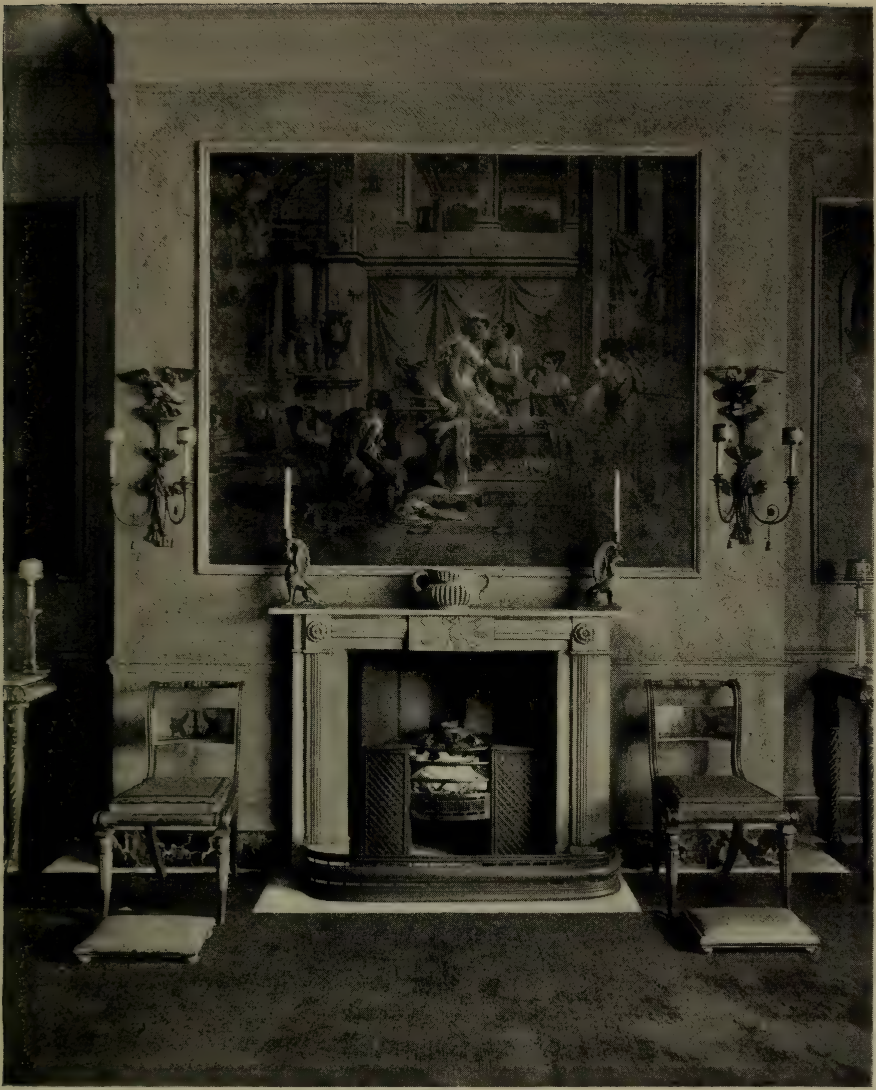
Everyone knows that the success of the big department stores and hundreds of others is due to advertising. Now, is photography so utterly removed from all other vocations as not to need the potency of publicity? Emphatically, No! Why, even churches advertise.

Haven't you observed how human nature, especially in this country, wants to be told all about an article before purchasing? The world wants to be told over and over, again and again, but in some new way, the merits of methods and merchandise. Photographs are merchandise made to order; that's all.

The idea of getting all you can, of the best you can, for the least money you can, is indelibly stamped on our minds—superior quality attracting some, low prices others.

Talk quality first, price next. Make the best photographs in your town, then talk about them in your advertising.

Has it occurred to you how the constantly changing styles in mounts is a powerful lever to move more trade? Of course, you buy liberally of new goods as fast as they are shown. But goods won't sell themselves unless helped by honest, straightforward sound sense and persuasive talk in advertising. And inasmuch as it is neither dignified nor policy to have a barker or sandwich man parading before your door, the best and most dignified medium is the newspaper. Women are the buyers and the readers of ads. Rest assured if you have any-



By MATTIE EDWARDS HEWITT
NEW YORK CITY

thing to say in the newspapers, women are going to know it.

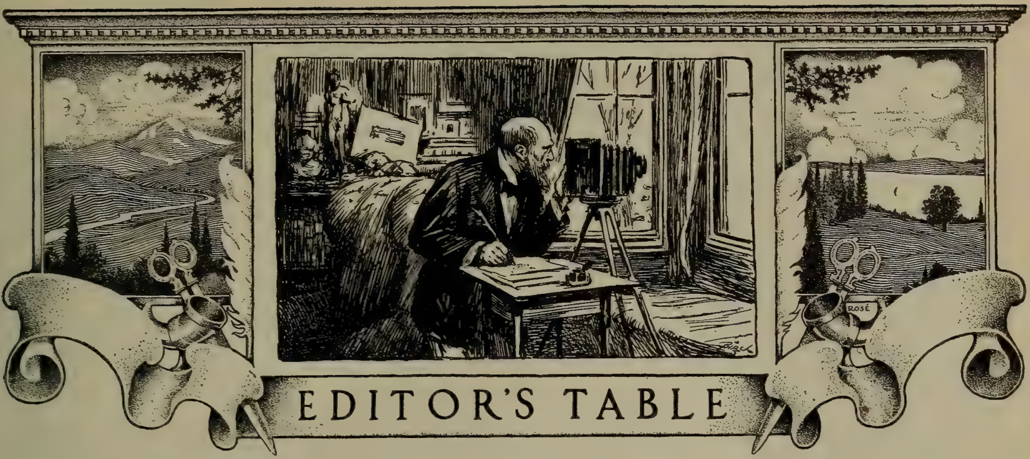
The old way to introduce a new style is to fill the cases (not even a card announcing the name or price) and wait several weeks before the community "gets on" to them through some one's private praise.

The new way—business-bringing way, money-making way—is to tell it to the town through the newspapers. Such announcement coupled with cases filled with attractive prints never fails to bring results.

Everyone is in the photograph business to make money, and any one who says contrary is much mistaken. When under the skylight we are after the dollars, all we can get of them in a legitimate, business-like way. You might sit and gloat over a handful of medals, and still starve or have a spasmodic, mediocre trade! Skirmishing around the back edge of the field, spitting on your hands, getting a "good ready" for opportunity, if it should swoop down upon you, is eating up your rents, courage and credit. Wise ones will clap on their spurs now and ride to the front! Good work and good advertising are sure winners. And the studios that will make money in the near future are those that turn out good work in a short time, medium priced, and advertise the fact.

But you say, "I haven't the time to write my ads, and when I do they don't read right, and nothing comes of them." That's the point to discuss right now. If you haven't the time or skill, procure the services of some one who has. There are plenty of excellent ad writers whose skill put into your business will give it life and prosperity. Be sure, however, you select some one who is in sympathy with photography, else his logic is dry and lacks the right ring that catches the customers.

Lastly, remember that all the advertising in the world won't hold trade and bring more unless the conduct of the salesman and the goods bear out the announcement. For if there's a place on earth where an Annanias comes to grief the quickest it is in a photograph advertisement.



EDITOR'S TABLE

GETTING YOUR PRICE.

TO be really strong in maintaining fair prices you must be content to start in a small way, make a reputation for good work, always uniform, and turned out with promptitude. Deal only with good business firms who pay up promptly, and give them business-like terms. Don't be too craving for business unless it is good business. Advertise by every possible means that you do good work, and in the end business will come to you instead of you having to go after it. You can then demand your own prices, and you will get them if they are fair. The good business man—the successful business man—is never a cut-price man. You may point out instances where the contrary seems to be the case, as in some big retail stores which appear to have been built up upon the principle of small profits and quick returns, but if you are able to penetrate deeper into their methods you will see that the secret of their success has been good system. They have ascertained the minimum profit at which business can be conducted, and how much they can save by good management and cash transactions, so that in this way they get the pull over competitors who never know just how they stand. The moral then is obvious: that you must shape your business methods so that waste and loss are reduced to a minimum, and thus turn out at a fair price better work than your neighbor and *with greater punctuality*. And remember first, last, and always that the photographer must study and practice business methods just as much as he practices the technic of his profession. Yes, even more, for the average photographer has often a predisposition toward photography and has often a positive aversion to business.

Business elements should not absorb or swamp the artistic sensibilities, but must be present as the motive power under which, if properly directed, the artistic qualities of the studio are to be made to improve and grow in value year by year. We are never to surrender our artistic ideals, but always do the kind of business that will bring money returns.

THE TRUE VALUE OF CONVENTIONS

IT seems hardly necessary, at this day and time, that anyone should be called upon to show the value of conventions in any walk of life, but more especially in ours, which combines so much of the artistic with so much of the business phase. The great idea of the times is centralization; we find it in business, in the immense trusts and combines, which are nothing more or less than perfected conventions of the highest type; we find it in the social world, where the classes naturally adapt themselves along the lines of their personal likes and dislikes; and we find it in the politics of the world; and in labor circles as well.

A convention, which, in its primary meaning, is a coming together, is a part of civilization, a part of progress, and an important part. Every being who has the power of conveying feeling by sound feels the need of associations, and associations are conventions of the simpler type. Men cannot meet without exchanging experiences, and all talk is but the exchange of their experiences, either real or imagined. The wisdom from books is not the practical wisdom of the world; it is the wisdom from experience that makes successful men—men who profit by the mistakes as well as the work and success of others. This, then, is the first object of a convention, and in this object there is the meat of what is sought after. "In much deliberation there is much wisdom," says some old proverb-maker, and he puts in a nutshell the value of conventions. In every word spoken there is a hint, in every experience detailed a suggestion for the future, and, if we can but grasp these potent facts, we must acknowledge that we have received good from the convention, and the amount of good received is dependent largely on each one present.

Men who travel along the beaten track —who get into a rut, as it is called—never improve or advance; they crystallize, so to speak, and each year of this crystallization hardens the crust and makes the man less open to the suggestions that would aid him, and, it may be, start him on the road to success. It is not given to any one man to know it all; but in these comings together, these conventions, we get in a short time what some others may have spent years to obtain.

There is no loss of time to the man who will properly appreciate the value of such a meeting. A simple formula will serve to make all of us get the greatest good out of the big coming convention; and we would state it in this wise: Mix a little application with a vast deal of comprehensive listening, and to it add willingness to learn. When this is at the right condition flavor with a determination to profit by what we hear and see, and then we will find the convention a most delectable dish, and one that will not only increase our appetite for conventions, but also our capabilities for appreciating the value and profiting thereby.

PRACTICAL PAPERS ON STUDIO WORK AND METHODS

The Tone of the Studio

It is recognized by most manufacturers that it is a bad policy to attempt to run two grades of quality under the same firm-name or even in the same works. Rolls Royce and Ford are both well-known names, but the quality of their products differs widely, although both are satisfactory to their respective clients. If, however, the Rolls Royce firm were to attempt to compete in price with Ford, one of two questions would inevitably arise. One would be: Is the price for the luxurious car too high? and the other: Why not buy the cheap car if it has such a good name behind it? Precisely the same situation is created when a photographer capable of doing good work endeavors to increase his output by running postcards and other cheap lines. The result usually is that patrons will choose the lower-priced styles if they are sufficiently good, so that in the end, although the volume of business is increased, the profits are actually diminished.

Anyone starting as a photographer should come to a decision at the outset as to the style of work by which he will stand or fall. If he elects to do high-class portraiture he must arrange accordingly. Prices need not be high but should be remunerative, and any temptation to drop below the standard originally fixed should be resisted. This gives a distinctive tone to the business such as is enjoyed by many of the "select" dressmakers, milliners and tailors in our large towns. When such a course is adopted it is possible to get better prices when introducing new styles, but if there are any cheaper lines shown it is difficult to do so. We have known several photographers who have tried the experiment. One had two departments in the same building. Those customers who wished to be taken by the principal were charged a higher rate than those who were content with the work of an assistant. This man did a large business, but died insolvent. Another well-known man ran two studios of different status, the second under an assumed name, the work of both being finished by the same staff. This resulted in a pressure of work that interfered with the careful methods by which he had made his reputation, and after a short time the second studio was disposed of to someone who could devote all his energies to it.

It is perhaps hardly necessary to suggest that the class of business aimed at should be well within the capabilities of the individual photographer, but we have known cases where the quality of the work done could hardly be called mediocre, yet comparison with the work of really good artists has been invited. In such circumstances disappointment must ensue, and this can hardly be wondered at. This is, however, not the usual thing: many clever workers are modest and apt to put too low a value upon their productions.

When it is decided to attract a good class of customer considerably more must be spent in furnishing and decorating the premises than for a cheaper class of business. Such outlay is not extravagance, but a good investment, being, in fact, a form of advertisement which costs little after the first plunge. As regards materials, the best quality only of printing papers and mounts should be used, and platinum or carbon offered with their guarantee of permanence. Stationery should be of the best quality and of artistic design, avoiding elaborate display, "costly as thy purse can buy, yet not expressed in fancy," for a good impression produced by a reply to an enquiry goes far in securing an order.

Especial care should be devoted to the show case or window, and nothing should be displayed which the proprietor is not perfectly satisfied with. It is a good plan if the ordinary run of sitters is rather commonplace-looking occasionally to engage a professional model for the purpose of making specimen pictures. In the majority of cases it will be a good investment to do so, as such negatives are the photographer's copyright and should bring in money for advertising and other purposes.

It must not be supposed that these remarks apply only to studios of the highest class. Even in a small town a photographer may give his studio a distinctive note, and care must be taken to do nothing which is not in harmony with it. We have seen a very good portrait show quite spoiled by the introduction of a roughly mounted set of postcards of some local happening. The greatest care should be taken to preserve a distinctive character in enlargements and colored work, so that comparison between them and those offered by other studios cannot readily be made on a cash basis. Lastly, but of great importance, those who would raise not only the tone of their own studios but of photography generally must do all in their power to attain for it the status of a profession and not merely a trade in which profit and not quality is the only desideratum.—*B. J.*

Sunlight

How often do we see a really successful sunlight picture, something which really gives the impression of warmth, of atmosphere and bright light? Why is it that so many of these pictures fall far short of what we saw and what we thought we were going to get? The reasons of failure are various, and I am going to try to point out some of them; but where to begin!

Plate, lens, exposure, development, subject. To begin with the latter, if we stand out in the bright sunlight with our backs to the sun the landscape will have a certain amount of flatness, with patches of shadow on the ground. In this position we get maximum of light and minimum of shadow, and as we turn to the right or to the left the shadows begin to show on the sides of the trees and objects more and more strongly and in greater proportion till we are facing the sun, when we obtain the maximum of shadow and minimum of light. The sky equally will have changed from a deep blue in the former to a grayer shade in the latter case.

For the sake of example, let us select a suitable subject, with the sunlight coming from, say, the half-right. This will give a fairly large shadow surface and small lighted surface. The difficulty which presents itself is how to get detail in the shadow without blocking up the high-light and how to retain "atmosphere" or aërial perspective. If you are equipped with a good anastigmat working at *f*/4.5, just open it out as wide as it will go and try to focus your picture. The depth of focus will be small, but compensate as best you can, and then take a look at your picture. It will be full of light and atmosphere, and perhaps too soft and fuzzy in the foreground and in the distance. Now close down the stop to *f*/32 and see the difference. Sharpness will be there all right, but atmosphere will have vanished; the picture you see will be hard and flat. Your shadows will have lost their beauty, so you find you must open the stop again. Do this slowly. Get it as far open as you possibly can consistent with a "sufficient" depth of focus, which with careful compensation you may get at *f*/6.8, or even a larger aperture. Anyway, see that the picture on the ground-glass looks as sunny as you want it to be.

Before going into the question of exposure a word about plates will be useful to some. The picture we have just focussed on the screen is in color, and we are going to render this in monochrome, and we want to get a faithful rendering and retain all the values. For instance, the sky is blue, with white clouds, and we wish to retain the relation of tone between the two. Those yellow flowers in the foreground are of light tone; we do not want them represented as black, nor do we want the light green grass rendered as a dark tone. Therefore we must use panchromatic plates with a properly corrected yellow screen. An "ordinary" plate cannot render these things correctly.

As regards exposure, a meter is useful, and the test should be made in the shadow, since we want to obtain details in the shadow, and we must allow, of course, for the multiplying factor of the yellow screen. Make your exposure for the shadow, because you cannot develop out any detail which is not there. If this is your first experience of this kind, better take three negatives, giving them all the same exposure.

As you are using panchromatic plates, which are also red-sensitive, it is as well to do the development entirely in the dark and use the usual time methods. It requires some experience, but the makers usually give full instructions.

A good negative should be able to give a range from white in the high-lights to black in the deepest shadow. In the present instance, our high-lights will be overexposed, therefore we must be extra careful not to overdevelop them. If we develop for the normal time, the high-lights will probably be too dense; they surely will be if development is carried further. This you can test with your three negatives, and they will serve as a guide for future work.

Supposing the time for a given developer is five minutes, develop No. 1 plate four minutes, No. 2 five minutes, and No. 3 six minutes, or, if you prefer it, reserve No. 3 and develop it according to the results obtained with the other two.

If the plates are not all developed in the same dish at the same time, fresh developer should be used for each, as a developer which has been used already does not give the same result in the same time as the fresh one. If these instructions are carefully followed a good printing negative, with plenty of detail in the shadows, and with good gradation, should result, and sunshine will be there.

The points to remember are:

Large aperture.
Expose for the shadows.
Develop for high-lights.—*B. J.*

Hints to Commercial Photographers

ALTHOUGH the following hints are nothing fresh to the old hand, they may be appreciated by the beginner in this particular line. Leather goods, such as hand-bags, etc., are not very difficult; the chief aim should be to show the texture and marking of the hide. Work in a dull light and give full exposure, using screens and orthochromatic plates and a weak developer.

Shop fronts are not easy subjects, and should be studied well before photographing. The great trouble is reflections of opposite buildings and the passing traffic. The best time to photograph is the very early morning, and often by using a small stop and a slow plate, and then by giving a long exposure, the people passing will have no effect on the plate.

Stained glass and memorial windows should be taken on a dull day, as the trouble here is halation. At times it is necessary to erect a temporary platform, or work from a step-ladder. Where this is not available, the swing back must be used. Don't develop for a harsh negative, but for soft detail. Machinery should never be taken out of doors, as the strong top light causes deep shadows. A machine should not be photographed directly in front, as it will have a very flat appearance. All bright parts should be daubed over with soft putty. If parts underneath are wanted to be shown, or those in the shadows, they should be painted with a "flat" drab paint (a paint without gloss). Letters and figures which want showing should be painted with white. Sometimes machine shops are very badly lighted, which means a long exposure. Photograph when all the machinery is stopped, or the vibration may upset your camera in some way or other.

Furniture should show the markings of the wood, which is difficult when the surface is polished and finished. Where possible it is better to photograph before they are polished, and this of course obviates the reflection difficulties. Furniture is best photographed in a room where the ceiling, floor and walls are a light color—white, for preference, with a good light behind the camera. Illumination can be softened by placing tissue paper over the windows; also screens should be available to cut off any undesired light. The size of the image is very important, but the firm will supply particulars as to what is required.

In commercial photography the field is so large that it is possible to mention only a few subjects. Panchromatic plates must be used when photographing subjects with many colors, such as carpets, paintings, etc. Screens are absolutely indispensable to the commercial worker. Plates of medium speed are best, and should always be backed. For general work the camera should be a strong pattern, with all the usual movements. The tripod should be of stiff and solid pattern. The people who want photographs for advertising and other commercial uses only want the very best, so set your mind on giving the best every time and success will be yours.—*B. J.*

The Outside Jobs

In all large towns, and also in many small ones, there is a considerable amount of work to be undertaken for collectors, estate agents, breeders, fanciers, etc. But, in order to do really successful and satisfactory work, the photographer must first make himself acquainted with the rudiments of the subjects with which he is dealing.

In this connection I would like to point out what may seem a rank contradiction: That often the most successful work is the most unsatisfactory from the photographer's point of view. I mean it in this way. The photographer—especially the successful high-class one—usually prides himself on the artistic excellence of his work. But often when such work is needed for a trade purpose, technical accuracy may be of far more account.

I once had the handling of a number of glorious pieces of old china—Wedgewood, Pallisy, Sèvres, and others—things to delight any artistic soul, but, alas! the owner set far more store on the clearness with which the makers' signs, trade marks, names, etc., could be reproduced, in order to prove their origin. They were for sale, of course, and the owner paid well for excellent technical prints.

If you ever have to photograph a violin for catalogue or sale purposes, lay the fact to heart that it is a good photograph of the outline, *f* holes and arching that is wanted, and struggle not for artistic effects. The master-craftsman who made it is already supposed to have put in the artistic workmanship. Any handbook will furnish a good list of the points to be looked for in its construction, and this will serve as a guide in working for any local music dealer, or owner of valuable instruments.

Take breeders again, whether of horses, dogs, cats, cattle, poultry or any live stock. If these are for sale or exhibition, they are judged by certain merits evident in their form and breed, and "points," or marks, are awarded for their possession in any marked degree. Combs, tail-feathers, legs, ear, back, evenness of markings, width of shoulder, smallness of muzzle, all these things count. Before going off for a long day's work on farm or stables, turn up the articles bearing on them in any good encyclopedia or other work of reference. If the memory be inclined to play tricks, jot down the points of most importance in a note-book, and look it over before starting out on the job. This will serve a threefold purpose. It will save wasted plates, expended on perhaps more artistic but yet useless points of view. It will ensure more respectful treatment from grooms, stablemen, cowmen, and others, who will respect the photographer and treat him with courtesy in proportion to the knowledge he displays. It will ensure more satisfactory results being sent to the customer, prints that more definitely fulfil his desires, and will often save a second journey and doing the work all over again.

There is a great deal of work to be raked in from breeders and fanciers, and they pay well for the sort of work that suits them, just because it pays them to pay well for photographs that sell their stock. In this connection many photographers might well study the advertisement pages and the photographs reproduced therein in *Country Life*, *Vogue*, *Vanity Fair* and all and any of the big weeklies, as these columns are the recognized mart of all kinds of valuable goods, animals, property and articles of vertu, and a photographer who will take the trouble to do a little specializing in this kind of work, over and above his ordinary studio portraiture, will soon acquire a reputation in his district.

Keep a good-sized index-book, and at your leisure write down the chief points of all such things as china, silver, old furniture, musical instruments, cattle, horses, dogs, pictures, and so on, as you come across them, and it will be most helpful to you. Then also keep a good-sized album on the reception-room table, with the best representative specimens of all such work you have done, so that any and every stray client may be put in mind of it, and many casual orders—profitable ones, too—will come your way, from proud owners of old silver, sideboards, and so on. When photographing silver be careful of the crests, monograms, etc.; often the retoucher can help this out, very carefully, with a sharp darning needle stuck into a wooden holder to clear up blurred lines, and a little soft lead work to give good crisp touches of high-light. Remember, it is the graceful outline that is valued, so that often a dark background serves the purpose best. I might here mention that an ordinary steam kettle kept on the boil often makes it easier to photograph silver, the steaming dulling it sufficiently to make it photograph crisply. Only take care now and then, if the job is a long one, gently to clear the lens with a soft chamois leather. This also is sometimes a useful dodge where there is a good deal of bright machinery, which, under the steam, soon dulls down.

When photographing old furniture, etc., at the owner's home, and in dark corners, a little magnesium ribbon is sometimes most useful to even up the lighting if waved about, and is far safer, less messy, and better than flash powder for dark interiors.

Now, as to working for house agents—a class of work of daily occurrence in many districts. Let me advise you to take somewhat distant views, and then enlarge them. The effect is often infinitely better, and does lend what the agents call a "dignity" to an otherwise unprepossessing building. If not, keep as close to the gateway as possible, make your carriage-way look as sweeping as you can, and avoid showing odd bits of stable and garage yards. Sometimes agents greatly fancy corner views, showing bits of at least two sides, and always if possible include any trees or large shrubs. A little compass and notebook are useful here, so that you can note which plates were exposed on the north, south, southeast front, and so on, and this information, lightly pencilled, is often much appreciated by agents, as it saves an unnecessary journey to verify these particulars. Just write the number of the slide in pencil on each negative before it goes into the developer, and there you have it. Such little details soon gain a name for a photographer with estate agents, who will in consequence leave him more free to follow his own devices in such work. But, above all, remember that these people are all out to make money as well as the photographer; they care less about art than they do about securing prints thoroughly businesslike from their point of view, and this is the reason that so many pushful amateurs have secured this class of work, ousted the professional, and gradually developed themselves into the cheaper class of photographer.

Allotment holders and florists, too, are a likely field; it is easy to arrange a few samples of peas, beans, potatoes, etc., as in a flower show, for specimen purposes, and then watch for the shows and put a timely note in the window or local newspaper, or both. Very many such odd jobs go a-begging to amateur friends which the photographer might have if he displayed a little energy. Only, such prints must be good prints to catch the eye, outstanding and good, if possible, in every way.

Also it is a pity that more photographers are not better acquainted with the properties and working of color plates. These will be coming again into the market shortly, and in ever-increasing quantities. Once the technical details are mastered there ought to be a good opening among florists, seedsmen, keen gardeners, and others for color plates, which by the duplicating methods now in use can be as well turned out in number as the recognized every-day print. At least it offers a new and wide field for work and enterprise, and one which astute house agents may be trusted not to neglect. At any rate, all these matters are worth attention: if not given by professionals, the amateur will step in ahead of us.—G. E. H. G. in *B. J.*

An Outline of a Workable System

"A PLACE for never-a-thing and never-a-thing in its place," would be a more applicable rendering of an old-time proverb in the case of some studios I have visited.

There may appear much liberty about such a free-and-easy style, but the time is bound to come when it is dearly paid for by perhaps an hour's search for a single article, with all its attendant irritation. On the other hand, what compensation will result from a little self-imposed discipline in the pleasure of finding things just ready to hand when wanted?

Many and various have been the systems put forth. The writer, however, has adhered to none in particular, but as hitches have occurred (and they will) the point has been considered and a plan arrived at whereby the same hitch would not occur again, and, if workable, it has been included into the daily routine.

To begin, then, the system greets the sitter from the very outset, though behind the smiling face of the receptional. All names, as well as addresses, together with the order, are systematically entered and numbered in the book kept for that purpose. It might be observed such a thing is too obvious to mention, yet the case of a money-making photographer comes before the mind who never kept books at all, and therefore never took even the sitter's name. The number of copies required and amount paid was just pencilled on the plate in the dark-room, and the photographs themselves served to distinguish between one order and another.

A good look at the photograph was followed by a scrutinizing glance at the caller in order to ascertain if the features were identical. But alas! for the chaos that resulted from such lack of system.

Proofs, then, are promised by a given date. Exposed plates are put into boxes, labelled for every day in the week on which they are taken.

When busy it is not always found practicable to develop the day's takings the same evening. It is convenient therefore to be able to put your hand on Monday's or Tuesday's and develop and proof according to promise.

The number, order and date promised is transferred from the book to the negative, the proof now returned confirming these details.

The negatives, when retouched, are placed just where the printer will look for them, under a label showing what process and if contact or for enlarging.

A large paper bag is kept for prints requiring to be toned, labelled "Sepia."

The prints are pressed every morning and entered roughly in a printing book, showing the number of prints done and any over or spoilt.

A dispatch book is handy for reference in the case of callers or delay in post.

Another very important item is to have a nest of pigeon-holes alphabetically arranged, similar to what is seen at the post office, where all photographs "to be called for" are placed. Finally, when putting a thing out of hand put it just where it will be looked for when wanted. The observance of this rule will save time, temper and talk. —*B. J.*

The Inherent Design

A COMMON notion of composition in portraiture is that the artist pulls the sitter about as a painter might adjust a lay figure and then spreads or bunches drapery, places books, flowers, or other accessories just exactly where they will look nice, and then, lo! the picture is composed.

I should like to get the beginner to see that although such ideas may be at the back of the artist's brain, there is no practical necessity for so much arduous physical labor. The artist must not set his picture as a draper sets out his window. His part is to adopt the wait and see method.

The sitter arrives and the photographer immediately begins to think—to see the finished print. The sitter is introduced to the spot where operations take place. He, or she, is consulted as to style of thing, if that has not already been the topic of a previous consultation, and the sitter poses. (See that the pose is natural, otherwise failure will be hard to avoid.)

There, before him, is the photographer's material for a composition. What does it present? Is there a fine shape in the whole arrangement? Are there the makings of a fine shape, that might easily be completed and strengthened by some accessory or some background feature? These are matters the photographer must learn to decide upon in a flash—and they are settled in a flash when practice has made the problem familiar. Should there be nothing promising; should the figure be lumpy, presenting no grace in its shape, then another pose must be tried.

The final result, bounded by the four edges of the print, must always be kept in the mind's eye, and the ruled or masked focussing screen will help toward this.

The reader may here interpolate, "That's all very fine, but I don't know what to picture in my mind's eye." Very well. That is the occasion for a little art-philosophy, and the justification of these articles.

Things are either pleasant or unpleasant in arrangement. When they are unpleasant, it is usually when they are haphazard, unrelated, chaotic. But when they are related to each other when they suggest growth, order, progress, balance, then they become interesting. A plant with its stem, leaves, and blossoms is a beautiful thing, because all its parts are related to each other in its system of growth. But pull it to pieces, and throw together the leaves, the stem, the leaf stalks, the flower stalks, and the petals, and you get nothing but a meaningless collection. A portrait or a picture, the parts of which are not related, is just as meaningless.

There is a simple idea in the shape of the plant growing naturally. It perhaps has one leading line in it, even though it may be bushy to make a single design. At first he would be tempted to make a symmetrical design, as a child might; but that would not be pictorial; that could be what is called decorative. We cannot arrange our sitters in a formal and symmetrical manner in the ordinary way; although it has been done for special purposes. The bones and box-lids and claws and matches must be welded into one shape. Moreover the shape itself must have that grace, spring and singleness of idea which the natural objects themselves possess.

When once this idea of organic beauty is grasped, it becomes quite easy to put everything together to form a design having one ruling organic motive or idea. The figure supplies an organic shape; everything about it or near it must either be part of the shape or be so disposed in connection with it as to enhance the complete design by continuing it, by repeating it, or by contrasting with its chief lines. In this way homogeneity will be assured; simplicity will come of the single idea, and precedence will not suffer by competition of accessories.—F. C. TILNEY, in *Professional Photographer.*

VIEWS AND REVIEWS

Keeping up Interest

After two or three years of business activity and prosperity, there has appeared a lack of interest and pep in the business. This is perfectly natural, for nearly every one has worked hard and has had business offered without any effort to get it. It is also probable that the increased business has left a surplus of profits that has dulled the edge of thrift and energy, and there is not the driving force of necessity behind us that compels us to maintain the customary aggressiveness.

In most of the countries of Europe this phenomenon is much more pronounced than in the United States, and it is causing real concern in France, England and Germany.

Little Belgium seems to be immune from the disease, as they were in dire poverty during the German occupation, and they would not and did not work hard for the conquerers of their little country. Having had a rough time, they are ready for good, hard work, and they need the money and have to hustle to get it. They are, therefore, going after business with the old-time energy and force.

How far the apathy will go in this country is a rather difficult question to answer. There is a very decided diversity of opinion, ranging from the optimistic class, who believe that it will be of short duration and that the natural energy of our people will keep them pushing at their business after a very short breathing spell, to the pessimists, who doubt that it is just a passing phase, but who believe that in order to prevent it growing to serious proportions it is necessary to stimulate the interest and energy of our business people, that they may not let decay get a firm foothold. They look to the organs in the various trades to point out the tendency and to combat it before it does any harm.

We decline to be pessimistic, but we feel that there are sensible and unanswerable arguments in favor of watching this apathy and not permitting it to make any headway in this country. We believe that to foresee it and to forestall it is to demonstrate the alertness of our business methods and customs. We believe that by recognizing the possibility of it we can prevent the probability of it.

The manufacturers of photographic materials have taken hold of the situation, and two of our leading firms have started a well-planned campaign to keep photography before the public and to stimulate the interest in pictures by photography. This is more than an advertising scheme; it is a big, generous, broad-minded view of a situation where organized action in a big way will be for the benefit of the users of photographic material. They hope and expect that the photographers will appreciate the situation and will see that the national advertising campaign will benefit the individual only if he will back it up by a display of energy on his own part.

The manufacturer profits only after and if the photographer profits. Such advertising as he may do to arouse the interest of the public in having photographs made will prove profitable only in case the local photographer coöperates by personal effort to convert this interest into actual business. The manufacturer shoulders one-half of the burden and is justified in believing that the photographer should and will shoulder the other half. But the big idea is that the photographer is presented with a great opportunity, and it is positive that a goodly percentage will take advantage of it, and we feel that it is our duty to encourage any activity that will induce a larger percentage to get in.

The mediums through which this campaign is carried to the public are the popular periodicals of the country that have the largest circulation among that class that can be counted upon as yielding the largest amount of response. The photographer who is interested has but to watch the pages of these magazines and get the cue as to when and how to time their efforts with the big effort. Properly timed team work will accomplish much more than random effort, and we urge upon our readers that they keep careful watch for these general publicity advertisements and make use of them for display purposes and as a basis for individual effort to convert the attention and desire that has been aroused into actual business.

The prosperity of the nation is based upon the prosperity of the individual, and a financially disorganized nation is caused by the financially embarrassed individual.

There have come to our ears whispers of photographers who are expressing themselves as regretting that they spent too freely of their profits during the period of active business during the war, and they go farther by confessing that they are beginning to feel the pinch of a reduced volume without a corresponding reduction of expense. If the pinch is sharp enough, all who failed to save should jump at this opportunity to boost trade, and it is devoutly to be hoped that the next time they enjoy a good business and make a little extra money they will profit by the past experience and save enough to prevent embarrassment when trade slackens.

With the present high price of living we have got to hump ourselves to make both ends meet, and it is coming to pass that it is not optional as to whether we will hustle; it is compulsory. There are, and we are afraid that there are too many for our good, radically minded gentry who favor the letting down of effort and the curtailing of production in order that a business depression may be produced that will give them an opportunity to fatten off of the public bounty.

This is designated in our day and generation as Bolshevistic propaganda. But it is a trick that is ages old and has been tried repeatedly in past generations under different names and different dress. The wise and thrifty leaders in our American business are not the ones who want to squeeze the masses. They want the country to continue prosperous. Their thrift and experience enables them to so fortify themselves that a business depression will not hurt them at all, but, on the contrary, will present opportunities that those who have saved and prepared can take profitable advantage of.

But they voluntarily take upon themselves the burden of helping business over its reconstruction period, because they prefer to make money side by side with all business men and workers, rather than make it at the expense of any one class. There are individuals who would make their money from the misfortunes of others, and such men are found in all walks of life. There are high finance artists who profit by such means, but they are easy-money seekers and are far removed from the American manufacturer who is working for general prosperity, for the very sound reason that he does his best business when every one else is busy.

If we all get busy we will all be happy, and the croakers of questionable reputation and sinister purpose will find slim pickings among the loyal, busy, satisfied American business men.—*Trade News.*

Death of George Hanmer Croughton

George Hanmer Croughton, a talented painter of portraits and miniatures, for several years in charge of the art exhibit of the Rochester Industrial Exposition, died Thursday night April 15, at his home, Rochester, N. Y., after a long illness. He leaves five daughters, the Misses Lottie H., Bessie H., Annie H., Mary G. and Amy H. Croughton, and one son, George Croughton, all of Rochester, also four sisters.

Mr. Croughton was born in London, England, April 14, 1843, and at an early age displayed a taste for drawing. At the age of sixteen, he entered the National School of Art, and later studied with Thomas Sidney Cooper, a member of the Royal Academy. Between the years 1862 and 1870, he made a tour through England and Scotland, painting and sketching and remained for some time at that work in Ireland. Returning to London in 1870, he was engaged by Southwell Brothers, photographers royal, and while with this firm painted several portraits of British notables, including one of Queen Victoria, by command. He also painted one of the late Napoleon III, the last one painted before the emperor's death. In 1872 Mr. Croughton was awarded a special, first-class medal by the Royal Cornwall Polytechnic Society for ivory miniatures. He later opened a studio of his own and obtained awards for exhibits at the International Exhibition at South Kensington, London, and at the Centennial Exhibition in Philadelphia in 1876. The success of his work at Philadelphia was influential in bringing him to this country to settle. He painted for a time in Philadelphia, New Orleans and Richmond before coming to make his home in Rochester. He was always an advocate of the more general use of photography in art and in 1865, when he became a member of the London Photographic Society, published several articles on this subject. He was known to photographers throughout the United States and has been a speaker and judge at several national conventions of the Photographers' Association of America, in which he was awarded an honorary life membership.

International Salon

The Fédération des Cercles Photographiques D'Anvers will hold an international salon of photography in August next, during the seventh Olympic festivals. Entry blanks may be obtained of the Honorary Secretary, Café Suisse, Place Verte, Antwerp, Belgium, and all American exhibitors are invited.

Southern School of Photography

The sixteenth annual term of the Southern School of Photography opened April 5, with the largest enrollment at the beginning of a term in the history of the school, and indications point to a continued increase.

An interesting program, consisting of music, songs, and addresses was give after which the students were organized in classes.

There were fourteen States represented, with a number from Canada.

Prices Still Go Up

It must stop sometime. It can not keep up indefinitely. There is good and sound reason for each advance, and the photographic trade has fared better than almost every other line, but it becomes embarrassing to record further advances each month.

Just as we went to press last issue we announced the advance in the list of all papers made by the Eastman Kodak Co. The new price list has been distributed through other channels, but any who have not received one of these lists will be supplied by application to any dealer.

Since plates and papers were advanced there has come the professional apparatus and Graflex and Cirkut cameras. Portrait cameras and all of the parts and accessories have advanced approximately 20 per cent., and the advance in Cirkuts and all of the apparatus and accessories pertaining to them and Graflex cameras is in about the same proportion. The lenses have not advanced.

We do not feel equal to giving particular reasons for these advances but are able only to treat them all in a very general way. So far as plates and papers are concerned we only wonder that they did not advance many months ago. Perhaps the change at this time is a little more disconcerting by reason of the fact that we were not prepared for it, or rather that our expectations were a thing of the past and we were lulled into a feeling of security because they had not advanced at the time we had expected them to. The causes developed with the scarcity of glass and paper stock more than a year ago, and it was deferred by the careful management of the manufacturers who anticipated their requirements so generously that they were able to sell at former prices long after the advance in raw materials had occurred.

Manufactured goods are high because they are high. There we enter the vicious circle that is expanding without apparently being able to expand to the breaking point and we can apply to this situation only the facts that are part and parcel of the dire results of the great war. There are those, we regret to say it, who did not interest themselves in the war, because they believed that it was an incident far away from this country and affected directly other peoples and other countries, but affected us only very indirectly. They were not interested in the line of trenches in France, but they are now beginning to exercise an interest in the aftermath because it reaches down into the pockets of each community and each individual.

We see an effort, too, to find a goat and to place the blame on some individual or individuals. The ones who were least concerned in the details of the war are now most stridently concerned in blaming some person for the result. Is it really the meat packers? or the coal operators? or the farmers? or the manufacturers?

When we read a wild headline in our daily papers or listen to some theory of an imaginative fellow sufferer, we jump at the opportunity and accept it as truth. But a later piece of news or a new theory sends us pell mell off on another trail, and gradually we begin to realize how ridiculous we are making ourselves by all of this wild scramble to find a goat. In our opinion, we are a nation of goats, and if we are seeking one let us each turn to his neighbor and point the finger at him. Our neighbor will do the same to us and he will be no further wrong than we are.

The public is crazy about buying. It will buy anything at any price that is asked. The merchant fears to carry a stock of high-priced articles, but he finds that his customers want the high-priced articles, and he has to buy in order to meet the demands of his customers. He runs out of stock while the buying is red hot, and he frantically places his orders with the manufacturer. He must have immediate shipment irrespective of cost, and the manufacturer ,n order to supply his demands increases his costs in order to boost production. Just as long as such conditions exist there will be no relief. On the contrary, other advances may be expected at any and all times.

So long as the final consumer can and will pay the price asked, no one is badly hurt. As soon as the purchaser is seriously hurt, he will not purchase at the price and will refuse to buy or will be unable to buy, and then something has got to stop. The merchant will not be sending hurry orders to the manufacturer, and the manufacturer in his turn will get ahead on his orders and begin to accumulate a reserve stock, which will be costing him a very high production rate. He will very quickly realize, for he is watching the situation as feverishly and nervously as every one else, that he must reduce the cost of production or stop manufacturing. He cannot pile up unlimited quantities of products at a manufacturing price that will not move them.

The campaign to encourage sensible and sane buying is the best means of meeting the present crisis, for that will hasten the day when production will catch up with demand. Any attempt to criticise or persecute the producer, in order that he may lower the price and thus permit the public to continue its buying madness, is only putting off the day of reckoning. We must accept high prices and shortage of supplies unless and until we are perfectly willing to curtail the individual consumption. Foreign buying is blamed by some, but figures indicate that the home consumption is on so much larger a scale, that if we but look after own private buying, foreigners will be able to take care of themselves.

A little patience. A little deafness to the wild preachments of uncontrolled minds. A little self-control. A little time. We will come out of this all right. Uncle Sam is all right at heart, but he can only accomplish great things when the entire family stands behind him and each individual does his particular best.—*Trade News.*

Exhibit at the Camera Club

F. J. MORTIMER, F.R.P.S., art editor of *The Amateur Photographer and Photography*, editor of *Photograms of the Year* and Secretary of The London Salon of Photography, has accepted an invitation to give a one-man show of some of his work at The Camera Club, No. 121 West 68th St., New York; and his exhibit will be displayed during the month of June, if it arrives from abroad in time.

Mr. Mortimer is one of the foremost pictorialists of Great Britain and, in photographic marine art, is unequaled in the world.

Asheville Photographers Organize

THE Asheville Photographers' Association was formally organized at a meeting in Pelton's studio, Asheville, N. C. on April 10. Twelve photographers and studio employees were made charter members of the organization and the following officers elected: President, Ray Mathewson, of Brock & Mathewson; Vice-President, H. W. Pelton, and Secretary and Treasurer, V. S. Stephenson.

The purpose of the organization is to coöperate for better photographic service in Asheville and to fight the familiar coupon and ticket agents. The members voted against employing any of these agents, who solicit business from house to house and leave the work of photographing and reproducing from poor photographs in the hands of resident photographers.

Additional steps toward the safeguarding of both the photographers and customers will be worked out from time to time.

Rochester Section Photographers' Society

AT a recent meeting of the Rochester section of the Photographers' Society of the State of New York, held in J. E. Mock's studio, the annual election of officers took place. John N. Heberger was elected President, Irving Saunders, Vice-President, and Joseph J. Heberger, Secretary and Treasurer. During the meeting Mr. Mock gave a talk on the State Photographers' Convention, which is to be held in Rochester in May, 1921.

Dr. Mees in England

Dr. C. E. Kenneth Mees, in addition to the other papers which he will read during his visit to England, will contribute a paper on "The Reaction of the Eye to Light" at the meeting of the Optical Society at the Imperial College of Science and Technology, Imperial Institute Road, South Kensington.

Bausch & Lomb's New Catalogue

Just from the press, with new illustrations throughout, this handsome catalogue will excite the admiration of all lovers of artistic printing and book-making.

It contains technical and practical information regarding photographic terms, optical properties of lenses and advice (illustrated) as to lens equipment for the various types of photography.

There are also complete descriptions, illustrations and latest prices of their famous Tessar Ic and IIb lenses for reflecting and hand cameras respectively; Protar Convertible Series for all-around photography and Series IV and V for side angle work—also the new Process Anastigmat for both black and white and color work, presented here for the first time; the Telephoto attachment and other accessories.

Write for your copy of this valuable lens-book to Bausch & Lomb Optical Company, Rochester, N. Y.

Cooper-Hewitt Light Popular

Since control of the Cooper-Hewitt Electric Company, Hoboken, N. J. was assumed last June by the General Electric Company, new business of the Company has more than doubled.

In order to meet the increased demand for industrial lighting outfits, as well as motion-picture apparatus, the Cooper-Hewitt Electric Company has recently purchased some adjoining property. This will eventually give more than double the present floor space.

Rapid strides have been made in the improvement and development of the Cooper-Hewitt lamp, chief among which is the standardization of the new 85 per cent. power factor outfit. Some radical improvements are under way which will materially increase the efficiency of this lamp.

The Engineering and Sales Departments have been materially increased by the acquisition of new men.

Royal Photographic Society Exhibition

The Royal Photographic Society of Great Britain will hold their sixty-fifth annual exhibition in September and October of this year. This is the most representative exhibition of photographic work in the world, and the section sent by American scientific men heretofore has sufficiently demonstrated the place held by this country in applied photography. It is very desirable that American scientific photography should be equally well represented in 1920, and, in order to enable this to be done with as little difficulty as possible, Prof. A. J. Newton has arranged to collect and forward American work intended for the Scientific section.

This work should consist of prints showing the use of photography for scientific purposes and its application to spectroscopy, astronomy, radiography, biology, etc. Photographs should reach Prof. Newton not later than Thursday, July 1, and should be mounted but not framed. Address, care the Eastman Kodak Co., Rochester, N. Y.

New Hampshire Photographers Meet

The Photographers' Association of New Hampshire held a two-days' get-together meeting at the Kimball Studio, Concord, N. H., on April 14 and 15. Practical demonstrations in paper, plates and the like were given by experts and factory demonstrators, and papers were read by members of the society.

The officers elected were W. H. Manahan, of Hillsborough, president; H. E. Cutler, of Keene, vice-president; George W. Perry, of Concord, secretary and treasurer.

The New Verito Lens

Although the old-type Verito has been popular the Experimental Department of the Wollensak Company has been on the alert for any possible new improvement. It seems that they have succeeded in their endeavor. A new Verito has been developed which has all of the characteristic qualities of the old lens, but practically eliminates the slight halation that was sometimes apparent with the old construction. Furthermore, this lens will give a softness at F:4 that is about comparable to the old lens at F:6, the result of which is that the professional photographer and the advanced amateur using the soft-focus type of lens can employ the objective at its widest opening without obtaining a displeasing fuzziness. The new construction makes possible exposure at a great speed with no danger of double line, halo or mushy appearance.

In enlarging with the new Verito it is unnecessary to use the diffusing stops as in the old construction. The construction is such that a beautiful degree of softness is obtained in the enlargement without the stops and the diffusion can be varied to suit the preference of the user. The old diffusing stops, which were numbered 1, 2 and 3, gave a diffusion which is comparable to the new Verito stopped to about F:8, F:9.5 and F:10 respectively, depending on the softness desired. The advantage of doing away with the stops lies in the fact that exposure is more than four times as rapid.

Further particulars can be obtained from the Wollensak Optical Company of Rochester, N. Y.

What's the Matter with the Country?

Something over nine thousand men have been talking in the different cities and towns, trying to tell the common people what is the matter with the country at the present time. Why railroads are not run on time, why goods cost so much, and a few hundred other things. They all have their own way of reasoning, but a vast majority of them close their addresses with the following reasons:

1. Those who are making more money than they ever expected to make before, men you might call get-rich-quick fellows, are spending the money and don't care how fast or how quick they get rid of it. They will pay any price if they can get the goods. A man walked into a hardware store and asked for a certain kind of hammer. The clerk said he was very sorry indeed, but they could not furnish it. The man said, "I will give you $25 for one of those hammers, I want it." The clerk still insisted they could not furnish the hammer, and if they could the price would be $3. "I don't care how or where you get it, get me one," said the customer, "and I will give you the $25." This is one of the things that is making the high cost of living.

2. There is a falling off of production. When men work as few hours as they possibly can and do as little as possible during those hours, it means they are producing about one-half of what they did before the war. If we can increase production to what it was from 1912 to 1914, and use our money economically, the high cost of living would soon be a thing of the past.—*Ohio Photo News.*

The New Model Heyde Exposure Meter

We have received from Herbert & Huesgen Co., New York, their interesting booklet on the New Model Heyde Exposure Meter, which is much more simplified than the former model that was on the market before the war. Instead of having twenty divisions for measuring the light on the subject to be photographed it is now divided into only eight divisions. The meter is of a convenient size that it can be carried in one's vest pocket. The booklet contains a special chapter on the use of the Heyde Meter for copying photographs and also enlarging on bromide and chloride papers.

We understood that the old models which Herbert & Huesgen formerly had on the market have been entirely discontinued by them and that they will handle only this new model. If you are interested in exposure meters send for a copy of this book.

The Copper Ferrocyanide Process

In the course of a demonstration before the Liverpool Amateur Photographic Society of the copper ferrocyanide process of intensifying and toning bromide prints with gum and pigment, Mr. T. H. Greenall stated that he now used 10 grains each of gelatin and gum arabic with 30 grains of white dextrine and no sugar in 6½ drams of water. He found burnt umber and ivory black better than Vandyke brown, which is somewhat soluble in caustic alkali.

Coating was done on a warm sheet of glass, and the coating must be as thin and as even as possible. If the pigment chips off in development it is due to thick coating. After development in warm water, the print is placed for a few minutes in a hardening bath of salt and alum, half an ounce of each in 18 ounces of water. This does away with any necessity to dry the print at this stage, and enables the pigment coating to withstand perfectly the process of sulphiding.

For partial bleaching with the object of obtaining intermediate sulphide tones, he used permanganate with salt and alum and without acid. This bleacher acts with remarkable evenness over the whole image. It must be followed with a clearing bath of sulphite and hydrochloric acid, or of sulphite, salt, and sulphuric acid.

If it is desired to lighten any area of half-tone which may appear too dark, this may be done by pouring warm water cautiously from the spout of a teapot on the part as the print lies under cold water; or, after treatment with the alum, the part may be lightened by gently drawing over it a very soft brush as the print lies under water.

If the high-lights or higher half-tones of the original are at all degraded the print may be partially bleached all over with a ferricyanide and bromide solution, and washed before coating with pigment. The bleached half-tones will sulphide up in the final print, but without added pigment, so that contrast is increased. This treatment may be applied locally, but the pigment used must be one which will harmonize with the sulphide image.—*Photography.*

Eastman Kodak Company Has Successful Year

The net profits of the Eastman Kodak Company in 1919 were $18,326,188, after all charges and Federal taxes, equivalent to $91.78 a share on the outstanding common stock after the deduction of preferred dividends.

In the preceding year net profits were $14,051,969, and $70.02 a share was earned on the common stock. Preferred dividends amounted to $369,492, and common dividends to $7,819,110, leaving a final surplus for the year of $10,137,136. The balance sheet at the close of the year showed total assets and liabilities of $88,718,112, against $76,648,002 in 1918.

The WORKROOM

CONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

Gum Bichromate: The Cheapest Printing Process
Making Paper Prints from Daguerreotypes
Bromide Paper for Negatives
The Chemistry of the Zinc Process
Liver of Sulphur Toning
Protecting the Hands
Etching on Glass
Sulphite and Alkali
Photographing Flowers and Gardens
Diluting the Developer
The Reproduction of Negatives
Subject and Lighting in Screen-plate Color Photography
Enamelling Prints and Postcards
The Technic of Print Spotting
Photographic Materials and Processes

THE WORKROOM

By the Head Operator

Gum Bichromate: The Cheapest Printing Process

THOSE who find it necessary to study economy in the pursuit of their hobby should not lose sight of the fact that in the gum-bichromate process they have the very cheapest process of any. In fact, its cost is practically that of any good cartridge paper on which to make the prints, plus perhaps 5 per cent., or even less, for the chemicals which are applied to it. Except for very small prints, it is quite suitable for any size picture.

The first step in making gum prints is to prepare the sensitising solution. For this purpose we weigh out two hundred grains of clean gum arabic, tie it up in a muslin bag and hang it in an ounce of water. In a day or two the gum will have dissolved, and any impurities left in the bag may be thrown away. A 10 per cent. solution of potassium bichromate may also be made up.

A sheet of paper, which may be white cartridge or some similar kind, is laid on a drawing board, with a few pieces of newspaper a little larger than itself underneath it, and pinned down. A thick cream of moist water color and of the gum solution is mixed up, and is then thinned by the addition of about twice its bulk of the bichromate solution. Ivory black, raw umber, and burnt umber are good colors to start with: and the gum and pigment must be most thoroughly mixed together before adding the bichromate.

With a flat camel-hair or varnish brush the mixture is applied to the surface of the paper. Only a very thin coating should be given, not enough to do more than give it an olive color even with the black; and the brush strokes should be crossed to get the layer as regular as possible. It is customary to advocate at this stage the use of a "badger softener"—a costly article—to even up the coating, but this can be done quite satisfactorily by means of a cheap hat brush. It is held with the hairs vertical to the paper, and dabbed lightly over until all brush marks in the coating are invisible. If the brushes are well washed in cold water *immediately* after use they will last in good condition for a long time.

The paper soon dries. If the coating is done in the evening it will probably be quite dry before one goes to bed, and may be put away in a light-tight box or drawer for use the next day. The coating can be done by artificial light, without any precaution, or it can be carried out in weak daylight, provided the paper is not left to dry in the daylight; as it becomes sensitive on drying. It is best not to coat more paper than is required for immediate use, as, although it can be kept for a few days, it begins to deteriorate from the very first.

Printing is carried out by daylight, the best prints being obtained from negatives that are not too strong. If they give good prints on ordinary gas-light paper they will be found to be of the right depth for gum printing.

As the image is only faintly visible during printing, a print meter of some kind is necessary. M. Demachy's plan is simple and all that is needed. A little of the bichromate solution is brushed over a piece of plain paper and dried in the dark. This paper can then be cut up into strips a quarter of an inch wide. One such strip is shut up in a book with half an inch protruding, and is left exposed to daylight for an hour or two, or until it has gone as dark as it will. On starting to print, the strip is pulled out a little more, and exposed beside the printing frame. The freshly exposed piece gradually darkens until it matches the first. When this stage is reached the print meter is said to register "one tint," and the paper is pulled out a little further for a second tint to be reached in the same way. The exposure required varies with the negative, with the pigment, and with its depth, but is usually from two tints upward.

There are various ways in which a gum-bichromate print can be developed, but if granularity is to be avoided it is best to adopt the plan of immersing the print face upward for a minute or so in cold water and then allowing it to float face downward on the surface, taking great care to avoid air-bells under it, and also to avoid touching the surface with anything solid. It can be raised at intervals of four or five minutes, and it will be seen on doing so that the pigment is gradually falling away from the paper in those parts where the light has had least action, and is leaving the picture more and more visible.

When the action of development has gone far enough, the print is drained for a few moments and then laid face upward on a folded towel or similar absorbent surface to dry. If this is done in daylight the action of the light will so fix the picture to the paper that, if there is any trace of stain left on the paper from the bichromate, it can be wetted again, putting it this time in a 2 per cent. solution of potassium metabisulphite, or of acidified sulphite. This will remove the stain, and the print is then given two or three changes of water and dried.

The process as here described is a perfectly straightforward one, and is not intended for those who wish to exercise "control" over their prints. Carried out carefully in this way it should be possible to make half a dozen practically identical prints from the same negative. It is a good plan to have mastered the process to this extent before attempting anything in the way of "control;" but when this is wanted it can be got by developing with water with which a proportion of fine sawdust has been mixed, pouring this mixture of water and sawdust over those parts of the picture which are to be lightened. Prints to be treated in this way should be exposed a little longer than those to be developed automatically.

Another method of control, which was carried out very successfully by Mr. Mummery, was to develop by means of a fine spray of water. For this purpose, it is necessary to print very lightly. The print is wetted for a few moments, and is then laid upon a sheet of glass in an almost vertical position. A spray diffuser is used to direct the water on to the surface, and in this way to wash away more or less of the pigment as may seem to be necessary.—F. M. LEYCESTER, in *Photography.*

Making Paper Prints from Daguerreotypes

By ALFRED J. JARMAN

THERE are times when the photographer is called upon to copy a Daguerreotype and produce a number of prints therefrom. Owing, however, to the discoloration of the Daguerreotype, some difficulty is experienced in producing a good negative.

If the Daguerreotype is one that has been well preserved, there being no discoloring to contend with, no difficulty will present itself in the production of a really good negative.

The only doctoring allowable in any correction of the negative is the blocking out of the impress made by the metal mat that was used in the original mounting and sealing of this beautiful photographic production.

Whenever this slight defect occurs, vignetting on the back of the negative by means of the air brush and a suitable fluid opaque will prove to be thoroughly effective. By a slight removal of the opaque, by means of a very small tuft of absorbent cotton tied at the end of a small wood stick, any part of the picture extending into the margin may be uncovered and a clear and clean impression secured in the print without detriment or injury to the quality and true representation of the original. The background may also be made clean and uniform by employing the usual method of vignetting.

If a tarnished Daguerreotype must be cleaned before attempting to make a copy of it, then the cleaning must be carried out with the greatest care. In no case must the surface be touched, owing to the deposit forming the image being formed of an extremely thin deposit of metallic silver, while the tarnished parts consist of sulphite of silver.

Cleaning the Daguerreotype before Copying. Remove the plate from its case by cutting the binding that seals the glass plate, metal mat and portrait plate together. If any dust should be present upon the surface, blow it off. *Under no condition may it be dusted with a brush.* Such an act would remove the image entirely or so scratch it that the picture would be ruined. Prepare the following solution carefully and label it "*poison.*"

Potassium or sodium cyanide	60 grs.
Distilled water	10 oz.
Stronger water ammonia	6 drops

As soon as the cyanide has dissolved, add the ammonia, shake the mixture well and it will be ready for use. Now take the Daguerreotype by one corner, wet it under the faucet and drain the excess of water from one corner. Then from a four-ounce glass graduate, pour on the cyanide mixtur along one side of the plate allowing it to flow all over, then drain into the graduate the excess of liquid. Continue this pouring on and off until the image and the whole surface brightens up.

Watch this proceeding closely and whenever an examination is desired, place it quickly under the faucet where a gentle stream of water must be kept constantly running. Rinse both sides, then examine. Generally the above treatment for one or two minutes will suffice to clear up the whole picture, when it must be well washed under the faucet again, then drain and finally rinsed with *distilled* water half a dozen times. It is then held by a pair of pliers at one corner, back down, over the flame of a spirit lamp or the flame of a gas stove, about six or eight inches from the flame, moving to and fro and blowing upon the surface to aid quick evaporation and perfect drying free from spots that would be certain to occur if the ordinary water from the faucet was used alone. Spots would be caused by the organic matter and salts which are always present in ordinary tap water. Distilled water must be used for the final rinsing.

Owing to the Daguerreotype being composed of an extremely thin veil of metallic silver, produced by the action of light upon a sensitive dry surface of iodide and bromide of silver, in the nascent state, brought out or developed by the vapor of mercury at 120° F., the resulting image is so constituted that it exists in what may be termed a state of metallic powder, hence the slightest touch will cause an abrasion.

Some Daguerreotypes are found to consist of a more solid deposit. This was brought about by a process of slightly gilding the developed image with gold by heating the plate while covered with a solution of hyposulphite of gold, which added greatly to its brilliancy as well as increasing the permanency of the image. The Daguerreotype was not altogether behind in the reproduction of pictures in natural colors. It was remarked by Daguerre himself, that the red bricks of a house and the green leaves of the trees and grass, are occasionally well represented. It was with such a picture, received from Daguerre on August 10, 1839, that Paul de la Roche paraded the city of Paris holding the picture high and exclaiming, "Painting Is Dead From this Day."

Copying the Daguerreotype. Procure a piece of board about eight or nine inches wide and a foot long. Cover this with dead black paper, pasting it firmly on the board. Then, when dry, place the Daguerreotype in the center, holding it in place by thumb tacks or pins driven in the board at the four corners and bent over to hold the plate firmly.

The top of the board must be made to lean over slightly toward the camera, sufficiently to eliminate side reflections. A sheet of white paper or cardboard, about eight inches square, may now be placed at the bottom of the board at about right angles so as to give sufficient reflected light for illuminating the picture. The tilting will determine this.

When copying a Daguerreotype by artificial light it is advisable to illuminate the portrait from both sides, leaning the plate slightly over toward the camera as already described.

When a top and side light is used as in the ordinary studio the Daguerreotype may be turned slightly toward the side light, still leaning over toward the camera. Some care is necessary, however, in making this arrangement so as to prevent the full reflection of light from paper at the base, because a glare would cover the face of the picture and thus defeat the object sought. Attention to these simple points will quickly enable the operator to secure a perfect lighting.

Focussing the picture may now be proceeded with and the size determined. In the writer's practice, ordinary commercial dry plates or films may be used to secure good results, although in some instances a process film or plate with a moderately long exposure will produce the best result. This, however, can only be determined by the operator. As soon as the exposure has been made, the development, fixing and washing are carried out as for the making of any other negative. By employing Eastman tested chemicals you will obtain the best possible negative.

Crystal pyro used as the developing agent will yield negatives unsurpassed in printing quality and may be relied upon as a dependable developing chemical for negative making when copying a Daguerreotype, insuring the production of the best prints possible.

The prints accompanying the article were made upon Azo Hard X from a negative copied from a Daguerreotype in the manner described.

Making an Ambrotype from a Daguerreotype. Excellent so-called Ambrotypes, or glass positives, may be produced from a Daguerreotype by using a Seed Process Plate in place of an ordinary plate or film, such as would be used in copying when producing a negative.

All these so-called positives are, in reality, negatives including the Daguerreotype but the transparency is not. It is truly a diapositive exhibiting the properties of a positive when viewed by either transmitted or reflected light. A print taken therefrom would be a negative while a print taken from a so-called positive (an Ambrotype) would be a positive.

The so-called positive when made upon glass is only represented as such by reflected light. By transmitted light it is a negative. These beautiful so-called positives, once known as Ambrotypes, can often be sold to the owner of a Daguerreotype, who wishes it copied, because they more nearly duplicate the original than prints could possibly duplicate a Daguerrotype. Ambrotypes may be made by the use of Seed Process Plates in the following manner:

Focus on the Daguerreotype to be copied as described; place the process plate in the holder and expose for two or three times as long as if you were making a copy with a Seed 26X Plate. Develop in an Elon hydrochinon developer, being careful not to carry development too far. Fix in the hypo alum fixing-bath such as is used for fixing prints—not in a chrome alum bath, and as soon as fixed, wash the plate thoroughly to eliminate every trace of hypo. While still wet, place the plate in the following bleaching solution which must be used in a perfectly clean tray that has no metal exposed. One made of hard rubber or a similar composition is best.

Bleaching Solution

Distilled water	10 oz.
Bichloride of mercury . . .	120 gr.
Salt	100 gr.

The water should be made warm (not hot) in a glass flask and the salts dissolved. As soon as the salts are thoroughly dissolved filter the solution through absorbent cotton, using a glass funnel. Then label the bottle: "Bleaching Solution—Poison."

As soon as the solution is quite cold, pour it into the tray and place the well-washed plate into it, rocking the tray carefully until the bleaching action is complete, which may be seen by examining the plate from the back. The plate may now be well washed in running water for about ten minutes, then dried spontaneously away from dust. Upon examination when wet or dry, it will present a beautiful picture when placed against a black background. The appearance might be described as opalescent.

As soon as it is dry it may be coated with Kodalak W. P. to protect the surface from atmospheric sulphurization as well as from moisture and other causes that might affect the compounded silver mercury picture. A coating of black varnish on the back of the plate will complete the Ambrotype when it may be framed in any way to suit the taste.

An ordinary Seed lantern slide plate may be used which will produce very brilliant pictures. The use of the process or transparency plates for this kind of photographic work is advantageous because they give a snap and brilliancy with clear shadows that is necessary for such productions as these.

The surface of these positives may be faintly colored with dry powder colors before varnishing if desired, making the finished picture very effective.

The writer has several portraits made seven years ago as described above and they are in as good condition as the day they were made.

A Daguerreotype, when cleaned, may be coated with Kodalak W. P. which, when dry, will effectually preserve the delicate surface from any further effects of sulphurization.—*Photo Digest.*

Bromide Paper for Negatives.

Now that the price of plates has increased, and it is to be feared that it will advance still further, also that of films, it behooves photographers, particularly amateurs, to consider carefully economical means of carrying on their adopted hobby.

Bromide paper has been proved to be by no means a makeshift substitute. The writer is acquainted with a photographer who for upward of five years has never exposed a plate or film, yet during that time has produced a great many presentable pictures, all by the aid of bromide paper; and, according to his narration, the percentage of failures is less than that experienced by many users of plates and films.

I was shown a considerable number of this worker's negatives and prints, and decided to try the method myself. I was surprised at the simplicity with which negatives could be produced, for it is a considerable advantage that no dark-room is necessary for development, an orange tinted lamp being safe, as in bromide printing.

A word as to the adaptation of the paper for exposure.

Take first the dark slide. A piece of the paper can be attached to a discarded glass negative by a touch of mountant at each corner. This must be allowed to dry under slight and even pressure. The paper has a tendency to curl inward to the emulsion side, which is an advantage, as it causes the paper to cling to the surface of the glass, thus maintaining an even surface.

A slight allowance may be necessary after focussing for the thickness of the paper from the normal position of the surface of the glass. Detach before development.

Users of the roll film should take care of the paper backing of their films. Procure the bromide paper in large sheets, and cut into strips to correspond with the paper backing. It should then be attached in the same way as the original film. Only "No. 1" end need be attached to the paper. It is advisable to wind upon a spool, commencing from "No. 1" end, and then to rewind upon another spool in the opposite direction. This will leave it ready for exposure in the camera in the correct order.

Should it be necessary to make a join, through the paper being too short for the entire length, care must be taken that such join does not occur in the middle of what will be an exposure.

The ideal method of adapting the papers for exposure is undoubtedly available to users of the film pack. Do *not* tear off the tabs as instructed, but leave them on after drawing them out in the usual way after the exposure of each separate film.

When the films are subsequently detached, and all the backing papers are arranged in numerical order, it is an easy task to substitute a piece of bromide paper in the same position. They should not, however, be stuck upon the paper backing but laid in position and fastened by a narrow strip of thin material or fairly strong paper with adhesive, laid over in contact with both the bromide and the backing papers. When dry the original "safety cover" should be placed in front of "*No. 1.*"

Withdraw the metal spring and black card support from the case and fold the tabs over in the same manner as they were in the first instance then reinsert the whole in the case and seal the two lower corners. The pack is then ready for use in the F. P. adapter. I have used the last-named method (quarter-plate size) with success; but I find that papers purchased in that size are scarcely long enough, as they are liable to protrude through the lower end of the mask. Therefore, there must be no margin wasted at the end where they are attached to the black paper support.

The best results are obtained by using a thin and fine grained paper.—W. FREEMAN in *Photography.*

The Chemistry of the Zinc Process

MANY photographers who have never before attempted the recovery of silver have come to the conclusion that they have a silver mine in discarded fixing-baths that is worth working, and so they have, but there is an expense attached to silver recovery that plays a very important part in determining the profits. There is a right way and a wrong way and the right way produces a big profit and the wrong way only a small one.

An exhausted fixing-bath that has been used for a large number of films or plates should be heavily loaded with silver and at the present price of silver should be worth about 50 cents a gallon. If you discard such a fixing-bath once a week and it is a five gallon bath, it is certainly worth while to recover the silver from it, but it would not be advisable to send the silver sludge to a refinery more often than every six months and it would be better to wait a year.

You have the original cost of zinc as a first expense and this zinc would not be completely exhausted in six months' time, treating only five gallons of solution each week. Freight charges or express charges would be approximately the same whether you send the silver-zinc sludge from one month's or twelve months' silver recovery and, in addition, there is a refining charge which is the same whether you send a small or a large amount of sludge to be refined.

An estimate for the recovery from five gallons of thoroughly exhausted fixing-bath each week for a year would be $130.00 and a broad estimate of the zinc used at 45 cents a pound would be $9.00. By making equally broad allowances for transportation and assaying charges the net return should be well over $100.00.

It is readily seen how one might be overly anxious about getting a return from his silver recovery and have most all of the saving eaten up by expense.

Further inquiries indicate that more about the chemistry of this process will clear up points that have not been thoroughly understood, or emphasize instructions that have not been carefully followed.

The amount of exhausted fixing bath that is to be treated should be about the amount that is discarded each week. The reason for our making such a recommendation is that the smallest amount of zinc can be used, and used over and over again until exhausted by keeping the recovery process in continual operation. It would probably take a year to thoroughly exhaust the original charge and the small amount of zinc added from time to time to speed up the process is hardly worth mentioning when the value of the silver recovered during the year is considered.

We have stated that the fixing solution, if alkaline, should be made neutral by adding acid, testing with litmus paper to determine when neutral and that it should then be made slightly acid by adding 3 ounces of 28 per cent. acetic acid to each gallon of solution. Someone who has never had occasion to test with litmus paper asks how the test is made. Drop in a strip of red and a strip of blue litmus paper. If nothing happens, the bath is neutral. If the red paper turns blue, the bath is alkaline; if the blue paper turns red it is acid. To neutralize an alkaline bath, drop in a strip of the blue litmus paper and and add acetic acid until the litmus just begins to turn red. To neutralize an acid bath, drop in a strip of red litmus paper and add an alkali until the litmus just begins to turn blue.

It is necessary to have the bath neutral so that a definite amount of acid may be added, 1 ounce of glacial or 3 ounces of 28 per cent. acetic acid to the gallon. This amount of acid is necessary for the rapid working of the process. If any considerable excess of this amount is present the acid dissolves the zinc, which is, therefore, wasted because it does not recover the silver as intended. If an exhausted fixing-bath is acid there is no simple way of telling how much acid it contains, so it is best to make it neutral and then add the proper amount of acid.

Stirring the bath is also necessary to bring the zinc in contact with the silver that is in solution. Stir the solution several times each day.

Exhausted hypo consists of a mixture of sodium thiosulphate, silver thiosulphate with sodium acetate, alum, etc., and in addition either free acetic acid, or if nearly exhausted it will contain sodium carbonate as a result of developer carried over by the films and prints.

Zinc will replace the silver from an acid solution of silver thiosulphate by plating out the silver on the zinc as a black slimy powder. After the silver has been precipitated, the bath contains as a sediment, zinc covered with a black sludge of metallic silver. And in solution we have zinc thiosulphate, zinc acetate, sodium thiosulphate, free acid and traces of iron salts which are present as impurities.

One photographer tested this solution and thought he found silver, although actually all the silver had been removed. He had not made the solution sufficiently acid in making his test. When it is thought that all of the silver has been precipitated, take one ounce of the liquid in a graduate, making acid with one-half ounce of 28 per cent. acetic acid, then add 100 minims of 10 per cent. sodium sulphide solution. A white precipitate indicates that all of the silver has been removed—a black precipitate that some of the silver is still in solution and that the solution should be stirred and allowed to stand longer. The above test will not fail.

But if the required amount of acid is not added when the test is made, the sodium sulphide makes the solution alkaline and iron sulphide is formed which is black and this, combined with the white zinc sulphide, gives a precipitate which leads one to believe there is silver still in solution.

Treat your exhausted fixing-baths as fast as they are discarded. Acidify as recommended above. Add two pounds of granular zinc to each gallon of solution. Stir occasionally and in twenty-four hours test to see if precipitation is complete. If it is, decant off liquid when all of the sludge has settled. Repeat this operation without adding more zinc until the process slows up so that three or four days are required for complete recovery. Then add a pound or two of zinc to again speed up the process.

Do not allow the solution to stand longer than is actually necessary for complete precipitation as the acid will dissolve a certain amount of zinc after it has performed its function of aiding the silver to plate out on the zinc. Decant the liquid as soon as the test shows the silver has been precipitated.

And do not send the sludge to a refiner until you have an amount that will make the shipping and refining charges a small percentage of the recovery.—*Studio Light.*

Liver of Sulphur Toning

THERE seems to be in some quarters a difficulty in getting satisfactory tones on bromide prints with the ordinary sulphide toning process. Instead of obtaining good rich sepia tones a rusty color is got, due sometimes to a want of density in the negatives, or to overexposure followed by insufficient developing, while in other cases no modification in working will give the desired color. To those who find themselves troubled in this way we recommend a trial of liver of sulphur (potassa sulphurata) as a toning agent. This has the advantage of giving a variety of colors, ranging from a warm black to sepia, including some very fine purple browns. One of its good points is an absence of the slight reducing tendency of the ferricyanide bleacher, and another is that even if the prints are inclined to be weak there is no liability to give a "ginger" color. The process is a simple one; the toning bath consists only of sixty grains of "liver" to a pint of warm water, a few drops of ammonia being added when solution is complete. This should be raised to a temperature of about 100° F., and the print immersed until the desired color is reached. A little allowance must be made for the further toning action, which goes on in the subsequent washing. Some papers will stand the heat of the solution without requiring hardening, but if there is any tendency to melt the prints should receive a preliminary bath of formalin, a convenient strength being two ounces to the pint. As with the hypo-alum bath, all papers will not tone to sepia in the liver of sulphur solution, some refusing to go beyond a purple black similar to P. O. P. A few trials with various papers will show the most suitable makes.—*B. J.*

Protecting the Hands

IT is very difficult to carry out photographic operations without occasionally getting some of the solutions on the skin. In most cases no harm results from so doing. The various reagents employed are quite innocuous, if we take the ordinary precaution of a wash after working with any chemicals; but some of them affect tender skins unpleasantly, and others may leave stains which cannot be got rid of quickly.

Rubber-gloves and finger-stalls are obtainable. They are open to the objection that they are awkward things in which to do any manipulative work if they are thick; while if they are thin they are very easily damaged—the edge of a plate may cut them right through in a moment. So that, unless circumstances make some such protection absolutely necessary—which is not usually the case in ordinary photography—it is best to look elsewhere for something to keep the solutions from affecting the skin.

One of the best methods known to the writer consists of applying as a protection a very thin coating of wax. Paraffin-wax, such as is used for candles, will do very well, or beeswax may be employed. It is applied by making a solution of it in some volatile solvent such as benzole. A few drops of the solution are poured on to the fingers and quickly rubbed over. The solvent evaporates almost instantly, and leaves behind it a thin film of the wax, which should not be thick enough to be perceptible at all, but which, nevertheless, will be found to be a great protection by the way, in which it fills up the pores and crevices. It is particularly useful in the neighborhood of the nails, as stains are almost always seen at their worst there. By the use of a firm wax for the purpose there is no fear of making a greasy mark on anything that is touched and the protection afforded will prove to be very effective.

After the work is done a wash with nail-brush and soap, using warm water, will remove all trace of the wax. The effect is that the skin is actually more supple and soft after the treatment than it was before. Wax is only a partial protection against the action of strongly alkaline solutions, which some people find so objectionable. In time the alkali will saponify the wax and will remove it, so that the fingers should be kept out of such liquids as much as possible.

Much can be done in the way of protecting the hands by having a basin of water handy, and rinsing the fingers therein as often as they are contaminated by the solution. If it is developer which is in use, the addition of a little metabisulphite to the water, or of a crystal or two of sodium sulphite and of citric acid will be found advantageous.—F. Randall, in *The Amateur Photographer.*

Etching on Glass

The following information may be of use to anyone experimenting in this direction. Glass is etched in hydrofluoric acid. If placed in the acid the etching is clear. If suspended over the fumes a matt effect will be obtained. One method of securing etched designs is to use the resist for making zinc blocks. The glass must be thoroughly cleaned and freed from grease by first soaking in a 5 per cent. solution of caustic soda, well washed and then rubbed over with tripoli powder and water, again rinsed and placed in a rack to drain. Before etching, give a final clean with a mixture of iodin and industrial spirit.

Industrial spirit	2 oz.
Iodin	¼ oz.

Coat with the following bichromated albumen solution: White of one new-laid egg, well beaten up, then add 20 ozs. of water and ¼ of an oz. of bichromate of ammonia and 5 drops .880 ammonia and filter. Fix glass on a whirler and pour this mixture over, drain excess off and whirl dry. Expose under a good line negative. After exposure roll up with stone-to-stone re-transfer ink and develop in running water by passing a swab of cotton-wool gently over the surface, when the design will show up in black ink. Powder the image up with bitumen which will adhere to the greasy ink, then gently warm until the bitumen glazes and turns a deep black, allow to cool gradually. If the glass is held over the fumes of the acid the portion uncovered will etch matt, leaving the ink-protected glass polished. Should the design be required to be etched, a positive instead of a negative must be used, or the ink resist obtained from the negative can be reversed as follows. Flow over the following solution:

Industrial methylated spirit or alcohol	10 oz.
Shellac	1 oz.
Dragons' blood (best)	6 oz.

When this coating is dry, remove original ink image with benzole, the resist being now dragons' blood and shellac.

The asphalt solution is made as follows:

Purified Syrian asphalt	1 oz.
Anhydrous benzole	10 oz.
Oil of lavender	⅛ oz.
Venice turpentine	⅛ oz.

Filter well, coat as before, and whirl dry. Exposure to enclosed arc lamp takes about one hour, or to bright light about five to eight hours. Develop with the following mixture:

Spirits of turpentine	6 oz.
Benzole	1 oz.
Linseed oil	½ oz.

When development is complete wash well with a spray of water. A quicker way of working the above method is first to coat the glass with the asphalt solution and dry. Then coat over this a bichromated glue solution:

Water	5 to 8 oz.
Le Page's process glue	5 oz.
10 per cent. sol. bichromate of ammonia	3 oz.
Ammonia, 0.880	5 drops.

Well beat up and filter and coat and whirl dry. Exposure to an enclosed arc lamp will take about eight minutes, to daylight fifteen to twenty minutes. After exposure, develop in running water, dye the glue image with a methyl violet dye solution, wash again and dry. When dry place in the developing bath previously described, which will dissolve away the asphalt unprotected by glue, wash again and remove glue film with a weak nitric acid solution. A design may be drawn on a good surface paper with the following ink:

Soap	20 oz.
Glycerin	8 oz.
Tallow	2 oz.
Water	4 oz.
Borax	1 oz.
Fluorspar	2 oz.
Lamp black	$\frac{3}{4}$ oz.

and then transferred to the glass by pressure, which is then etched in a 5 per cent. solution of sulphuric acid, the acid reacts with the fluorspar in the ink and etches the glass.

Great care must be exercised in handling hydrofluoric acid as it causes sores to form on the skin; the fumes will also form a bloom over any glassware near. This remark especially refers to photographic lenses or spectacles.—*B. J.*

Sulphite and Alkali

A POINT which recently came under our notice may be of interest to some of the many photographers who use pyro-soda developers. Our friend was complaining of the yellow tinge which pervaded all his negatives, and asked us to test a sample of the sulphite which he was using as a preservative. This appeared to be quite satisfactory, and the quantity which he was using should have been ample to prevent any discoloration of the solution. On investigating his methods we found that he was making rather concentrated stock solutions in considerable quantities, enough, say, to last a month or two at a time. When freshly mixed the developer was quite satisfactory, but it quickly deteriorated in spite of the fact that he was also using acid bisulphite in the pyro solution. We found, however, that he was mixing at least half the prescribed quantity of sulphite with the carbonate of soda, being under the impression that the salt would crystallize out if it were all used for the pyro solution. Upon making a test with dry pyro and the carbonate and sulphite solution alone it appeared as if no sulphite were present, although three time the weight of the pyro was actually present. It would appear, therefore, that the alkali had practically destroyed the action of the sulphite, which had been kept in solution with it. On making fresh stock with all the sulphite in the pyro solution the trouble disappeared, and the developer worked cleanly to the end.—*B. J.*

Photographing Flowers and Gardens

THE photography of flowers is no more difficult than any other kind of photography; in fact, it is much more easily dealt with than, say, the photography of animals or anything animate. The reason that so many of the pictures we see are crude and inartistic is mainly because they have been produced to order, and when a nurseryman or florist desires a photograph of flowers for business purposes he is apt to imagine that anyone can do that sort of thing, *i. e.*, anyone who can expose a plate—ergo, he goes to the cheapest man, or even asks some friend who happens to possess a camera to come and do the job for him.

Some of the best floral photographs I have ever seen have been the work of amateurs, and clearly show themselves to be the result of careful work, and not only careful, but carefully thought out, carefully lighted, and, if I may use the expression with regard to flowers, carefully posed and carefully grouped.

In dealing with this class of work from the professional's point of view, it will be best perhaps to consider firstly how to proceed with that portion of the work which has to be done to order—that is to say, the photographing of flowers in the garden, the greenhouse, or the conservatory, cut blooms in the house, or the floral tributes in the churchyard or cemetery, and afterward to consider what may be done to our own order with a view to publication.

When the order is to photograph a garden, it is obvious that we are to a certain extent handicapped—we cannot alter the conditions, we cannot, so to speak, pose the flowers, and we cannot alter the grouping. There is the garden, and it is our bounden duty to do the best we can with it. Now, if the cheap man before-mentioned were sent for to do the work and when he arrived the lighting was all wrong, the chances are he would not be able to afford to wait until it changed, but would simply set to work and expose his plate or plates, and get it over. This must not, however, be our method. The first thing is to calculate when the light will be best. This is almost sure to be either early morning or late afternoon, as a far better result is obtainable when the sun is low on the horizon than when it is at all strong. The next point is to select the position or positions from which the photograph is to be taken. If the garden is wanted as a whole, it will be, of course, a necessity to expose a plate upon it, and here a wide or at least a mid-angle lens will in most cases be necessary. The one plate exposed to suit the customer's requirements, one or two more should be taken to suit your own taste, including less in the picture. In this case it will be possible to use a longer focus lens.

I personally prefer a single lens for this description of work, and it will be found in nine cases out of every ten that, although a few are sure to be ordered of the whole garden, yet the main order will be for the more tasteful and artistic pictures, which do not include the whole of the surroundings, but merely the portions that best lend themselves to pictorial effect. Many photographers—and not only beginners—have a habit of standing their tripod at one regular height. This is all very well so far as saving personal inconvenience goes, but it does not enable the operator to obtain the best effects. In the case of the photography of flowers in a garden, the camera requires to be much lower, or the effect will be somewhat resembling a picture taken from a balloon or an airship. The better way is to try at three or four different heights, and carefully note the difference, which will be found to be far greater than one might at first suppose. Care should be taken to avoid too much sky, and equally to avoid an excess of foreground.

As the flowers in a garden are mostly of varied colors, and some, at least, of the colors which, with an ordinary plate would assimilate with the color of the foliage, it is an absolute necessity to use a panchromatic plate and a suitable filter to obtain the correct color-rendering. A full exposure should be given, better a trifle over than a trifle under, and development carried to the correct point, and not a vestige farther. There are some subjects that a shade of over-development will not hurt; but with delicate subjects such as flowers it is necessary to produce a delicate negative, with full gradation and without any clogging up of the detail. A mere impressionist picture is not what is required, but as nearly as it can be produced a perfect representation of the flowers in black and white, or, rather, in every natural gradation from almost a pure black to an almost pure white.

From the garden we pass to the greenhouse or hothouse of the nurseryman, and here we find ourselves rather more heavily handicapped than in the garden. The space is nearly all taken up by the flowers themselves, and that which is at our disposal is limited indeed. In nearly every case we are reduced to the necessity of using a wide angle lens, or affixing a "Planiscope" to a longer focus one, and so practically converting that into a wide angle. The latter, in some instances, will be found the better plan. First select the point of view and then try the effect of first one lens and then the other, both with and without the "Planiscope" attachment. Whichever you finally select, do not forget to give a full exposure. Should figures be required, as is often the case in this class of work, pose them as far away from the camera as possible and as though they were actually working, watering, pruning, tying up, disbudding, etc., and in each case just in a position where they will help to break up the straight lines, which are all too prominent in a greenhouse. It is quite possible to obtain a technically good result which shall at the same time not be without its art side, and our main aim should be to combine the two.

Most greenhouses will be found to contain only one kind of flower. It may be roses, carnations, chrysanthemums, sweet peas, or some other species; but in many cases they will be all of one color; in the case of pink or red or yellow roses the panchromatic or, at least, an orthochromatic plate should be used, and the same applies to the colored carnations, chrysanthemums, sweet peas, etc. But with white roses or carnations an ordinary back plate will suffice. Should the house contain more than one species of plant and multi-colored blooms, the panchromatic plate must be used.

Passing to the conservatory, much of the handicapping is removed, the flowers are mostly in pots, and so can be shifted and grouped so as to break up masses of any one color, and foliage plants can be introduced into the grouping so that really attractive and artistic effects can be produced. There is also far less of the straight-line element, and with the expenditure of a little time and thought and a modicum of artistic feeling, pictorial photographs should be obtained. Possibly there may be some pet plant or plants which require to be photographed separately. When such is the case it will be found preferable to remove them from the conservatory into a room where a soft sidelight can be obtained. In most cases it will be found that an angle of 25° to 30° will give the best effect, and a background can be used, of a shade varying according to the color of the flowers and their foliage. In some cases, as with white flowers and light green foliage, the black velvet focussing cloth can be used, being hung sufficiently far behind the plant to avoid any creases or folds showing in the picture. Should the blooms be red or yellow, a white table-cloth will come in very handy, as, according to the distance behind, so can the shade of the background be varied from dark gray to almost pure white. Here again the orthochromatic plate should be brought into play, and once more I would urge the necessity for a full exposure. Cut blooms should be treated in the same manner, special attention being given to their grouping and arrangement, and a suitable vase or bowl being used for their arrangement. If a single bloom or spray is desired to be photographed, rather a good effect can be produced by laying it on a mirror and photographing it with the reflection therein.

Although the cucumber cannot strictly be called a flower, yet very pretty and effective pictures can be made of a house used exclusively for their culture—the trailing and clinging vines with the admixture of bloom and cucumbers of varying sizes lend themselves to cover up the straight lines and help the artist to produce a picture worth the taking.

With regard to flowers in the shape of wreaths and crosses on the newly made graves of the departed, it is now the fashion to have these photographed for the purpose of presentation to the donors, and nearly every photographer at some time or other is sure to receive orders to proceed to the cemetery or churchyard in order to make a picture while the flowers are fresh. Many of the photographs we see of graves are merely a mass of flowers jumbled together, wreaths and crosses indistinguishable from each other, but through the whole the shape of the grave is clearly distinguishable, and the whole calculated to raise a feeling of repulsion rather than the pleasurable feeling that the sight of flowers usually induces. The main causes of these failures are to be found in bad choice of light, use of unbacked ordinary plates, under-exposure and overdevelopment. This may seem a sweeping denunciation, but it is not unjustified. The order comes in to photograph a grave, and an assistant is straightway sent off to do it. Arrived on the spot, he selects his point of view, focusses, stops down to about *f*/64, and, the light being strong and the flowers mainly white, gives a shutter exposure and considers he has done all that is necessary in the circumstances. The better way is to wait until sunset, then go yourself armed with a couple of backed self-filter orthochromatic plates. On arrival the first necessity is to re-arrange the grouping of the wreaths, etc. Instead of the solid mass of flowers, carefully separate them, so as to leave a little space between each offering. Then bring those from the side not seen to the front and lay them carefully on the bare ground in front of the mound so that every wreath shall be visible in the picture, and that the shape shall not be so suggestive to the morbid feelings. Some people like the cards and, if possible, the writing on them to be visible, but this is not at all a necessity; it spoils the picture as a picture, and, like the shape of the mound, always suggests death rather than the suggestion of resurrection, which the flowers themselves are intended to produce. Now focus very carefully, and use the largest diaphragm consistent with the sharpness of the flowers themselves, but at the same time keeping all surroundings indistinct and out of focus. Expose carefully and fully, choosing the moment when there is no wind to move the fronds of maiden-hair or asparagus fern. Before packing up, be very careful to replace all the wreaths in the positions in which you originally found them, or you may get into serious trouble with the sexton or cemetery-keeper who arranged them in the first place, although, possibly, the trouble might be easily "liquidated." On return home develop the plates yourself, and have them printed as quickly as possible, as delays in these cases are dangerous to the size of the order. A really good picture of the flowers will in all probability bring an order for the monument to be photographed later on.

When photographing flowers for the purpose of publication as studies or as picture postcards, cut blooms are the best to operate upon. They should be carefully selected, and only perfect blooms should be used. It will not do to buy a selection from a street seller and proceed to make photographs of them. Obtain your subjects from a nurseryman or a florist, and photograph them in the studio, lighting them as carefully as you would a human subject. Do not photograph bunches, but rather separate blooms or groups of two or three. See that your backgrounds are not too light or too dark, and where a vase or bowl is introduced, let it be at least artistic in shape or design, and in no wise obtrusive to the detriment of the flowers. They are the subject of the picture, not the vase. A series of flower subjects as picture postcards should, if artistically produced, find a ready sale; the wild flowers of England alone would make a good series, without taking into consideration the multitude of products of the nurseryman and gardener's art.—*B. J.*

Diluting the Developer

When development is carried out in a dish, using the solution at the strength specified in the instructions, it is safe to conclude that only a very small proportion of the total quantity of the active developing agent present is required for the work of developing; the rest is, to a large extent, wasted. When the cost of developers was small this was no great matter, and was counterbalanced by certain conveniences which follow from such a course, one of which is that development is speedy. It is customary with tank development to use a much weaker solution: and the question must have arisen in many minds whether, now that economy of solutions has become so important, equally dilute developers may not be employed in all cases.

It is well, at the outset, to remove any misconceptions that may prevail as to the effect of concentration of the developer upon the character of the negative. It has been contended that a weak developer gives a softer and more harmonious result than a stronger one; but although such a negative may be the result, it is not correct to attribute it to the fact that the developer is weaker. It is actually caused by the development not being carried quite as far. When development takes place much more slowly there is a very natural tendency on the part of the photographer to stop it at an earlier stage, and this results in the negative being softer.

Careful experiments and measurements have shown, however, that, as far as the gradation is concerned, the degree of concentration of the developer, within very wide limits, does not influence the character of the negative at all. If we get a soft harmonious result with a weak developer we can get an identical result with a strong one, provided we stop development at the right moment. There is often a difference in the appearance of the two negatives, it is true, but this is due to another factor being introduced. The negative developed in the stronger solution is finished much more rapidly, and it is therefore highly probable that the sensitive emulsion is exposed to the light of the dark-room for a much shorter time. It should not be so, but it very often is. The consequence is that the more quickly developed result looks brighter or cleaner, and the photographer is liable to think from this fact that it is actually harder in character. The prints from the two plates will be identical, however, provided the point to which development was carried was the same in each case.

It follows, therefore, that the proportion of water given in a developer formula may be varied within very wide limits at the discretion of the photographer without affecting the quality of his results, provided he is careful to alter the time of development accordingly. For comparatively small changes—and in this sense a doubling of the quantity of water is a comparatively small one—the time required may be taken as proportional to the quantity of water. If, then, we use twice as much water we must allow the developer twice as long to act; if we treble it we must allow three times as long, and so on. This may serve as an approximate guide, the actual times being modified a little one way or the other as experience may show to be necessary.

The question arises whether a greater degree of dilution than that specified by the formula is desirable or not. The first point to settle is whether the longer time required is inconvenient, as there is no way by which the development can be made rapid, still keeping the same degree of dilution. This is a question which the photographer must answer for himself. If he decides that he can give the longer time, the only point which need be emphasized is the importance of ensuring no longer exposure to the dark-room light, however "safe" this may be.

Subject to certain reservations then, we may dilute the developer at will. These reservations are twofold: One is that we must not use the solution so dilute that it does not contain enough of the developing agent to do the work. On this point we cannot give definite figures. It is impossible—if it were desirable on other grounds, which it is not—to proportion the developer so that it is all used up in the process of development. Two negatives on the same make of plate, and developed to the same extent, may require totally different quantities of the active developing agent for the work. One may be of some subject mostly shadow, with a few small strong high-lights; the other may be of a light subject, with a few small points of deep shadow. The first would require comparatively little of the developing substance, the latter a comparatlvely large quantity. Again, long before the last traces of the developer have been used up, the solution has become inoperative from the presence of by-products of the reaction. Therefore, we must take care to have enough developer present to make quite certain that no matter how great may be the demands of the subject upon it, there is still enough to do the work, before the action is unduly checked by such products.

The other reservation is that, when development is very prolonged, even if the plate is completely protected from light, the result will be dirty. Not only does the developer tend to oxidize and produce stain: but, for some reason or another, the negatives are more or less foggy, even with a very weak solution, if the time taken is very great.

To be quite on the safe side, we may put the longest time at about three-quarters of an hour, and the greatest degree of dilution necessary to ensure enough of the developing agent being present at about three times that given in the usual formulæ for dish development. Thus, if we take the formula on the plate box and increase the quantity of water until the total bulk is three times that given in the formula, and then use enough of this dilute solution to cover the plate easily in the dish—say, one fluidounce to each quarter-plate or equivalent area—we shall be on the safe side. It will be seen that this means considerable economy in developer in the case of dish development formulæ. The formulæ for tank work are usually as dilute as it is advisable to use.—*Photography.*

The Reproduction of Negatives

For a variety of reasons the necessity occasionally arises to reproduce negatives either in their original size or upon an enlarged or reduced scale. It may be that a negative of a celebrity or of a unique ceremony may be deemed of such value that it is desired to keep it as a "master" record and to print from the reproductions only, or a negative may be too thin or too dense to yield good prints, and it may be deemed too risky to submit it to the ordinary processes of intensification or reduction; or, again, it may be so stained or damaged that perfect copies cannot be printed in the ordinary way. Besides this, a separate negative of a portion only of the subject is needed, or enlarged or reduced sizes wanted for carbon or platinum printing. As we can control the contrast and density at two stages, the transparency and the negative from it, it is often possible to obtain results vastly superior to the original.

There are many ways of effecting our purpose, but I propose only to deal fully with that which most photographers will find most convenient, which is the making of as perfect as possible a transparency, and from that the negative. The character of the original will largely affect the selection of the plates used for the purpose, as it may be necessary to modify the result considerably, and I therefore detail the kind of plates necessary to do this effectively, at the same time remarking that with average negatives any good brand of ordinary speed or slow plate may be used throughout.

For very thin negatives "process" plates will give the best results, as it is easy with these to obtain in the transparency considerably more contrast than there is in the original. Moreover, they are more amenable to intensification than ordinary plates, and there is very little risk of fogging.

Dense thick negatives, on the other hand, call for a more delicate film; special transparency plates coated with the emulsion used for lantern plates will be found to give the necessary delicacy of image. Failing these, an "ordinary" or "fine grain" plate will answer very well. Those who work carbon will find the special transparency tissue very suitable, as very thin delicate prints may be made upon a glass support, and if necessary these may be strengthened by staining or dyeing, or even by intensification with pyro and silver solution. If the negative is to be made of a larger size than the transparency, the absence of grain in the carbon image renders it particularly suitable.

As a general rule I prefer to use a non-staining developer such as metol-hydroquinone, amidol, or Azol for the transparency. The same developers or pyro-soda may be used for the negative at the operator's discretion.

The exposure for the transparency may either be by contact or in the camera. For dense negatives the first is, as a rule, most satisfactory, while for thin ones the camera method is preferable. When making contact transparencies we must be careful to avoid parallax, which will destroy the sharpness in such areas as are not in actual contact. Modern negative glass is rarely quite flat, and as it is usually coated on the concave side it is possible to have the negative and sensitive plate touching at the corners only. Therefore it is necessary to have enough pressure to secure moderately good contact all over, and for this a frame with a plate glass front and strong springs is necessary. With very fine diagram subjects I have even had to use a process frame with $\frac{3}{8}$-in. plate-glass and screw pressure to avoid a spreading of the lines. In any case the printing frame should be kept quite still during the exposure, which should be made as far as convenient from an illuminant which is small in area. To give an example, I would give a distance of 5 ft. or 6 ft. from an unscreened inverted gas-burner, while with very thin negatives even a greater distance is recommended. The exposure should be long enough to yield an image which shows little if any clear glass. Lantern-slide quality is too hard, and will give harsh results. When using the camera the negative should be illuminated by a white cardboard reflector, and care must be taken to avoid shadows upon this, or the transparencies will be uneven in density. I frequently make both transparency and negative with an ordinary enlarging lantern, fixing up the plates on the easel, under the heads of small drawing-pins. As a rule, one or two thicknesses of ground glass should be interposed between the light and the condenser, except with very thin negatives, when a strong light and the full aperture of the lens will tend to give softness.

At this stage we may do much to even up our image either by locally shading the negative during contact printing or in the camera, or by shading the image in the way usual with bromide enlargements when the lantern is used. If a cracked or broken negative has to be dealt with, it should be printed by contact and kept in motion in a circular direction meanwhile. In this case we must risk parallax to avoid a greater evil. If such cracked negatives are very thin, they may be exposed through one or two thicknesses of white blotting-paper placed outside the frame, as this greatly reduces the effect of the edges of the crack.

Having obtained our transparency, we may proceed to intensify or reduce it, either all over or locally, and when dry to retouch or work it up until it is as perfect as possible. On a transparency we have the power of strengthening shadows as we do lights in a negative, so that "knifing" is not absolutely necessary.

The exposure of the negative plate may usually be by contact unless the size has to be varied, when the camera or lantern may be used in the way already described.

If the transparency is still lacking in strength a process plate may be used and intensified in turn; by this treatment quite a vigorous negative may be obtained from a mere ghost of an original. In no case do I recommend the use of very rapid plates for reproduction work, as not only is the grain coarser, but there is not the latitude in exposure and amenability to variations in development found in a slower plate.

If reversed negatives are required, either the transparency or the negative must be made in the camera, the film side of the original being turned away from the lens. A simpler way by contact is to use a portrait film for one or the other exposure, putting the back of the film in contact with the film of the plate; as a matter of fact, with ordinary subjects either side of a film negative may be printed from without perceptible loss of sharpness.

The simplest way to reproduce a negative is to copy a print, and this is extensively done in many establishments. There is, however, usually a noticeable loss of quality when bromide or platinum prints are used, and I much prefer to work from a rather lightly printed P. O. P. copy, which is put under pressure in a plate-glass printing frame and copied *without toning or fixing*. With care the exposure may be made by daylight if all preparations are made before uncovering the print, but a better plan is to expose by ordinary metallic-filament lamps or even incandescent gas light, which have practically no effect on the sensitive paper.

Several processes have been published by which a negative can be produced direct from another negative, but they can hardly be said to be adapted for everyday use. If a plate be greatly overexposed, a reversed image is produced, but usually of a foggy character. Sensitizing an ordinary dry plate in bichromate, and printing until the image is visible at the back and then developing and fixing, will produce a negative from a negative, the exposed parts having become insoluble and impermeable to the developer which acts upon the remainder of the film.

The "dusting on" or powder process will give excellent results by a single operation, but the manipulations required are too delicate for the average photographer. All the foregoing "direct processes" yield reversed negatives, which are only needed for single transfer carbon and certain photo-mechanical processes.—*B. J.*

Subject and Lighting in Screen-plate Color Photography

THE beginner in color photography by the screen plate processes, whose aim is the pictorial representation of Nature in her natural colors, will find that he has much to learn—and also to unlearn—before he can use his medium and produce results of high artistic excellence, if his previous experience has been confined to monochrome prints. I speak from the artistic aspect of the case as well as from the point of view of the technical photographer, to whom the mastery of the more popular screen-plate color processes is more or less dependent upon the following out of instructions definitely laid down. Perhaps some notes on the subject in color photography, generally about the last to be regarded as of much importance, may be useful when the reader shall be making the first essay in this wonderful and interesting branch of photography.

There is no doubt whatever that some subjects are far better for translation into photographs in natural colors than others, and here the independent amateur can score heavily over his professional brother, who, for commercial reasons, simply has to make color pictures of subjects required by his customer for advertising and other purposes. That the subject may not be the best for color photography probably has not entered into the customer's mind, except that he requires its colors set forth in permanent form for some purpose of his own. The professional has to do his best, but if the resulting transparency fails to please it will in all likelihood be due less to the fact that it is not a faithful translation of the subject than that the latter was not well suited for a picture of this kind, and in this case it is certain that a good black-and-white print would have been more effective. Such cases as this tend to give color photography a bad reputation. No painter could be expected to sit down and make a masterpiece of any subject that may be pointed out to him, though he could make a fairly faithful transcript of it. The result, however, would not be a picture. Now, because it is possible to produce photographs in natural colors, it does not say that every subject is going to be satisfactory as a color photograph either from the point of view of the artist or the photographer. I would point out to the amateur beginner in color photography that the art of producing pictures by its means is one not to be caught at a grasp, but demands much training and experience before the eye can recognize what will and what will not make a picture. But I am digressing. Let us then consider the subjects offered for color photography in a general way from various aspects.

The photographer must beware against letting his imagination run away with him to the extent that color prevails in Nature. Few people realize that under some aspects every landscape is a monochrome. Yet I have known color plates exposed upon such subjects. A faithful rendering was produced, I grant, but one that was no better, and perhaps inferior to a good black-and-white print. Every photographer who proposes making a color photograph should examine the subject carefully with a view to ascertaining exactly how much color there is in the *subject*, and how much exists in his own *imagination*—or, to take a similar case, the *colors* may be existent in the subject but the lighting may not be from the right source or be brilliant enough to show them up in sufficient brilliance. To take a simple instance, let us consider a larch wood just breaking into its delicate shades of green upon a fine sunny morning in late spring with the sun behind the observer's shoulder. Now examine it again at the same time on the first dull day, or later in the day when the sun is behind the wood. The colors in which the young green growth appeared in the first instance have all gone, and the scene is in monochrome, composed of a very few shades of the same dull color. Now if the scene was photographed at each time on a screen color plate each picture would—other things being equal—be a faithful transcript of the scene as it was. As a color picture the one would be a success and the other a failure. If any of my readers in the course of their experience of color photography by the screen plate processes have results in their possession, dull, lifeless, and lacking in color brilliance, they should consider if the fault is a technical one, such as error in giving the exposure or in some subsequent operation, how far the lighting of the subject was the cause, or to what extent it possessed color at all, and if the fault does not really lie in their own imagination, coupled with a lack of the observing faculty, instead of blaming the color process. Without seeming to press this point unduly, I would urge every beginner, and those who have not produced results as good with regard to brilliancy of color rendering as they desire, to consider this point very carefully.

For vivid color effects, of course, late spring or early summer is the time to be chosen, and, without doubt, early morning or late afternoon is productive of the best results, according to my own experience. In the middle of the summer the foliage has a more dull, heavy appearance, and the finer color gradations between trees of different species have for the most part disappeared. Mid-day is also a time to be avoided. Autumn, with its vivid colors, the thinning of the foliage, and soft, golden lighting, is also ideal for color-photography of woodland and landscape compositions, and I know of no subject that color processes render so well as a beech glade with its carpet of russet and gold made by fallen leaves, the silver boles of the trees turning to a rich mossy green at their bases. But this is a subject that requires brilliant lighting.

The composition of color subjects and the arrangement upon the plate call for a word or two. It is important not to have an inequality of lighting or this will throw the deeper shadows of the picture into a dull monotone. If there is a strong mass of color at one side of the picture, it is necessary that there should also be one on the other, even though the latter be smaller, in order to balance the picture. It should be the effort of the photographer to distribute his colors in the form of masses of light, shade, and color with a view to forming a satisfying restful pattern or design. In this respect the position of the camera has much to influence the production of a good result or a bad one, and the design or pattern of the picture, the disposal of its lights and shadows, is one that should have far more consideration from the photographer than it usually gets. Some time ago I was shown some color-photography done by a commercial photographer for illustration work in a gardening handbook. The subjects were herbaceous flower borders, set out by an artist in landscape gardening, but the composition of the pictures, as pictures, was decidedly faulty. In one of the pictures, depicting the pleasing curve of a border round the lawn, the difference of a few feet would have made a decided difference to the artistic value of the picture, and would have composed the whole into a pleasing pictorial design, while a graceful curve of the turf was rendered sharp and unpleasingly angular. Even commercial photography of gardens makes some demands upon the color photographer in the matter of design and the artistic arrangement of the picture. I should advise all color photographers to study form and color both from the works of master painters, and from a good art text-book dealing with this subject, since it has a greater bearing upon a successful result than many imagine. Many photographers do not realize the marked difference in this respect between color-photography and ordinary monochrome work. With the former we arrange our picture according to the light and shadow tones and values, but the color-photograph depends for its artistic success upon the arrangement of the elements of its composition as colors, each separate color having its part in the general design, the whole of which produces or spoils a satisfactory picture.

The treatment of the color subject also has a marked bearing upon a good result, since no modification of the definition or values of the pictures may be attempted. For the most part a fair sharpness is demanded over the whole planes of distance since fogginess in a color-photograph is not desirable. There is no objection, however, to a slight softness in the receding planes, but the principal object itself should be focussed with as critical a definition as is possible.

In landscape color work I have sometimes been asked if a figure tends to improve the general scheme. This, however, depends very largely upon the composition, but as a general rule I think that a figure—preferably a feminine one—does have a good effect upon the picture as a whole. For most commercial work it is desirable as supplying just the touch of human interest that is demanded to make an ordinary scenic or garden picture take the observer's eye. On the other hand, it is a difficult matter sometimes to decide where the actual picture is to leave off and the portrait or figure study is to begin. I do think that most commercial photographers put the figure too far from the camera, and in this way handicap themselves considerably in the way of producing an artistic result. Often the touch of color supplied by the model's dress is the saving point of interest in an otherwise rather dull scenic picture in the form of a lantern picture.

One word I would add in conclusion. With ordinary photography it is possible by various methods to modify the result. If, for instance, the subject is inclined to be weak it is a fairly easy matter to remedy the defect by recourse to combination printing, or by strengthening lights and tonal qualities. In color-photography there are no such methods available. Every picture must be reproduced straight from the subject itself, and must render the subject as the subject *is*. As far as possible the photographer who strives for artistic beauty in his results, and who is not tied by the requirements of other individuals in the matter of the selection of his subject, should make a choice from the abundance that surround him of such material as will produce a pleasing result by a mechanical translation of its own existing beauties. One thing is certain. If the results fail to please, and the fault cannot be conscientiously laid on the score of bad technic, then the best choice has not been made in the subject. Given a good subject, well lighted, carefully arranged upon the plate, color-photography by the screen-plate process may be absolutely relied upon to give perfect results in the matter of color translation, and with an accuracy that the most expert artist with brush and pencil may crave for in vain.—Robert M. Fanstone, in *B. J.*

Enamelling Prints and Postcards

Last year I gave a method of glazing or enamelling prints, using polished celluloid, and a domestic clothes wringer as squeegee. For prints to be used as originals for copying, celluloid gives a good surface, but for commercial postcards glass gives a much brighter surface, and the domestic wringer with India-rubber rollers is an ideal squeegee, giving absolute contact and removing so much more water from the cards or paper than possible with ordinary flat or round squeegee that the prints are dry in a quarter the time, and the risk of sticking from damp paper and long drying is reduced to an absolute minimum.

The following method cannot fail if once the plates are cleaned and properly prepared:

The ordinary domestic wringer with India-rubber rollers is usually 12 in. wide; two postcards placed end to end measure 11 in., so it will be best to provide plates $11\frac{3}{4}$ x $14\frac{1}{2}$, good 15-oz. sheet being satisfactory; plates this size will hold eight cards, and are a nice convenient size for handling.

The first preparation of these plates must be thorough, so as to get them into good working order; once this is done no cards can stick with reasonable facilities for drying.

First of all, remove the sharp edges of the glass by rubbing with a piece of corundum or carborundum, next soak in weak acid water (nitric, sulphuric, or hydrochloric), and clean the surface by rubbing with a rag. Rinse the plate and stand on rack to dry. When dry lay on sheet of newspaper on flat bench, and rub over the plate with a dry rag dipped in vaseline, taking great care that every part of the surface receives a coat of vaselin. The surface of sheet-glass is not so level as it looks, and it is surprising occasionally to see that small pools of surface often require extra attention to get them covered.

When the plates are all vaselined, dust them over with French chalk, and rub this gently into the vaselin. Then take a clean cloth and polish away the whitey film of vaselin and chalk, this polishing resulting in a beautifully polished plate.

The prints being ready are placed in position upon the polished plates and passed through the wringer. Great pressure is not required, only just sufficient to require the handle turning.

The squeezing pressure of the India-rubber rollers not only ensures absolute contact of print to glass, but most of the moisture in the cards is also removed, which, of course, tends toward much quicker drying. The prints or postcards may be soaked in water, or in any of the solutions sold for preventing sticking.

There is one cause of prints sticking when dried upon glass which has not received the attention it deserves, viz., the method of drying.

Drying takes place quicker and with less risk at a low temperature and with brisk movement of air than at a high temperature and in a stagnant atmosphere.

An electric radiator in a room 12 x 10 x 10, with window open at top 12 in., will dry a good quantity of prints on plates stood upon racks standing between radiator and open window. Where electricity is not available, an upright gas radiator of six columns will be as efficient (and cheaper). Where neither gas nor electricity is available, a small Primus stove of the roarer variety, with occasional attendance for repumping pressure, is also efficient, but never attempt to utilize an ordinary paraffin stove with a wick, which always behaves so well when carefully watched, but if left alone for a few hours the result is disastrous—the stove smokes, and the proverbial inch-thick of soot is deposited.—W. T. Wilkinson, in *B. J.*

The Technic of Print Spotting

Due to the many request for information as to the best method of spotting Cyko prints this article has been written—not because the method necessarily is the best, but that those who are not obtaining the results desired may have the benefit of the experience of another to aid them in their work. As one photographer says, "I understand what to use, but it is the technic or method of application that bothers me."

The most particular photographer, as a rule, has the least spotting to do, although accidents will happen. It is well known that the occasion for extensive spotting comes from careless manip ulation somewhere from the unexposed plate to the finished print, but one sometimes becomes careless unconsciously.

The average pin-hole spotting is really the least difficult to handle. The big scratches in draperies, backgrounds, and even in faces, are the accidents that are so discouraging, and unfortunately they seem bound to occur on the most valued negatives or those which cannot be re-made.

Transparent tints should always be used—that is, the pigment should be reduced in density with water rather than with opaque white, for with opaque tints one is never sure of the exact shade required on account of their drying out lighter than when they are applied. The reason for this is that the print itself is transparent, and that all its brilliancy comes from light reflected from the paper base through the emulsion; therefore all spotting should take on the transparent character and texture of the surrounding silver deposit.

We find that lampblack, sepia, and India ink are the most satisfactory pigments for all black-and-white prints — lampblack for cold black tones, and sepia or India ink for warm blacks. All so-called sepias, brown or warm-brown toned prints, may be matched identically with raw or burnt umber used alone or mixed with one of the blacks mentioned. Raw umber should be used for warm browns, and burnt umber for cold browns. These water-colors can be purchased in small pans or tubes at any art store, and they will last for years as only a small amount at a time is used. The brushes required are the Nos. 0, 1, and 2 sable. A divided white china or earthen pan for mixing colors and washing out tints is desirable, although an ordinary saucer or other small white dish will do. Care should be taken in selecting or mixing the pigments to have them match. The next step is to wash out to the desired tint with water or saliva. The chances are that saliva will prove more effective in your technic than water, as one seems instinctively to point the brush, or wipe it out if the color is too dark, with the tongue or lips. It may not be hygienic, but it does the work, and it is the general practice among the best workers to do this; of course, it is best to be particular, and if this method is used all brushes and plates should be marked for identification.

The very common white spot is covered easily with a dot, using a No. 0 or No. 1 sable brush brought to a point with the lips, and small patches on skies or plain grounds are filled in with stipple until they match the surrounding tone. For large patches we sometimes use fine cross-hatch lines, expecially in draperies, to match the surrounding texture. In filling in foliage all that is necessary is to follow the surrounding composition of single leaves, clusters, masses, or branches. In grass plots or fields it is very easy to replace lost detail by drawing in the grass, weeds, or stones; even parts of fences, stone walls, rocks, or buildings can be replaced by careful study and handling, so that the defect is not noticeable to one not versed in art work.

In portrait studies, parts of chairs, tables, the hair, draperies, even finger and face modelling can be replaced by the careful worker. In machine and technical work the clever artist can often save a valuable print that otherwise would entail much labor and expense to duplicate. Again, a negative from which a print must be made may be cracked or broken, and with a little pains prints from such negatives may be filled in so that the marks are not noticeable. These cracks usually take a diagonal direction, which is fortunate, as the different tones through which they pass are then broken masses of light and shade, and when filled in to match with pigment become practically invisible to the eye.

We have been asked many times for a method to produce invisible spotting on glossy paper and glossy ferrotyped prints, but we have not found a mixture that would dry with the paper gloss. However, in our opinion this is unnecessary, for the reason that on a high gloss print spotted by the methods given the spots are, in effect, lost unless one looks for them.

While it is not really spotting, there is another treatment which often helps out otherwise mediocre prints on platino or semimatte surface, especially in white, chalky skies, or white masses in drapery or backgrounds. This is the use of crayon or lead scraped from a pencil rubbed out with powdered pumice-stone to the right tone, then applied to the print with a tuft of cotton. The necessary high-lights are then produced by wiping out with a pointed soft rubber eraser. Very pleasing effects are obtained, which are hardly distinguishable from the real photographic portion. In our opinion it is much superior to the air-brush because of its being less mechanical.

Another pleasing variation is made with broad washes on white background portraits or on draperies to give a hand-painted or brush effect, which truly adds a distinctive touch. This treatment might also be used to advantage, if well applied, to landscape, genre, or figure studies, giving the effect of wash drawings. In connection with this it is well to state that great assistance may be obtained in giving character and individuality to pictorial photography by studying the work of present-day artists in black-and-white in the best of the popular illustrated magazines, also the photographic illustrations of Lejaren á Hiller, who combines painting with the print. In this type of illustration the backgrounds and accessories are painted on the print, and then the combination is copied for reproduction. The method used is monochrome tempera, or distemper, which is a combination of opaque black pigment reduced in tone by the mixture of Chinese white as required, using water or a thin glue size as a medium, and applied the same as oil-colors. India ink, sepia, or lampblack are usually preferred.

There is an unlimited field for the photographer who is able artistically to combine a natural or acquired talent for drawing and painting with photography, and who is able to produce prints with exceptional merit and characteristic quality that give both pleasure and profit.

If the negative contains holes or scratches which will show black patches in the sky, middle tints or high-lights, it is best to spot these out in the negative with heavy opaque, giving a blank white spot in the print, then fill in to match the tint; but if a hole shows in the foliage, shadows, or grass, the foreground should be broken up with thin pigment to match the negative density and detail, and thus avoid any but the slightest spotting of the finished prints. It should be remembered that the print is a blending of light and shadows of the same color, and that black spots and lines in deep shadows require little or no attention.

Water-color pigments are mixed with a size, but if trouble is experienced in making colors adhere, especially to glossy surface papers, any sticky substance, like albumen, gelatin, gum arabic, or sugar syrup, may be added in mixing the tints.—W. H. Smyth, in *Portrait.*

Photographic Materials and Processes

Photographic development; Chemical induction in ——. I. Induction and the Watkins factor. S. E. Sheppard and G. Meyer, Communication from the Research Laboratory of the Eastman Kodak Co. Phot. J., 1920, 60, 12—21.

The accelerating effect of small quantities of potassium iodide on developers, first observed by Lainer in 1891, is only slight except with developers such as glycin and quinol, which have low reduction potentials or high induction values. In most cases the effect is merely on the induction period, the Watkins factor being increased. With a quinol-carbonate developer, however, there is also a marked alteration in the degree of development (γ), particularly at low temperatures. The accelerating effect starts at very low iodide concentrations, rises to a maximum at which it remains over a certain range, and then rapidly falls to a minus quantity; with quinol, for instance, the maximum effect occurs at concentrations from $N/1000$ to $N/100$, and retardation is obtained at $N/35$ upward. The possible nature of the iodide action is discussed, especially in connection with the suggestion, previously made, that the first stage in development is formation of a complex of silver halide and reducer. Experiments on the absorption of safranine by silver bromide, without and with iodide treatment, are adduced in support of this view. Plates bathed in dilute potassium iodide solutions ($N/1000$ to $N/100$), washed and then developed give fog. If such a plate, after washing, is fixed and then developed in an acid developer, a black, coarse-grained fog appears, different from the usual fine-grained image obtained by physical development. It is suggested that the fogging effect is due to a nucleus infection of the silver bromide grain.

Photographic rendering of contrast; The fundamental law for the true——. F. F. Renwick. Phil. Mag., 1920, 39, 151—154.

Since the characteristic curve of a plate expresses the relationship existing under certain conditions between the light gradations of an object and those of the resulting negative, and a similar relationship between the negative and the print is obtained from the characteristic curve of the printing material, a combination of these curves will show the relationship between the object and the print. This method was referred to by the author in 1916, and in view of a recent reference by Slade and Porter (Phil. Mag., 1919, 38, 187; is now explained in detail. Two instances are given, a neutral-tinted grainless wedge being taken as the object, this giving a very convenient means of impressing a known series of exposures, changing in the same way as do the values of log E along the exposure axis of a characteristic curve. In one case the correspondence between print and object is deduced from known curves for negative and positive material, and in the other the requisite curve of the positive material to obtain a desired print from a known negative material.

Color screen plates or films for photography in natural colors; Manufacture of ——. M. Wieland, Berlin-Tempelhof, Germany. Eng. Pat. 137, 502, 29.8.19. (Appl. 21,263/19.)

A phenol-formaldehyde condensation product is used as the medium in a multi-color screen. A suitable coloring material is added to the phenol and formaldehyde and the mixture atomized before the condensation is completed. An intimate mixture of different colored globules so obtained is dusted on to a prepared plate, the excess dusted off, and the plate then heated so that the globules soften and coalesce, and the hardening process completed by heat, and, if necessary, by pressure. A final coat of colorless condensation product is then applied. The resulting screen is unaffected by heat and ordinary solvents.

Vol. 57. No. 7 July 1920 20 Cents

The Photographic Journal

of America

Published Monthly
With Illustrations

SMITHSONIAN INSTITUTION
DEC 19 1920
NATIONAL MUSEUM

Efficiency in the Printing Room

can never be obtained with make-shift or antiquated equipment. A reliable, scientifically correct, modern printing machine is essential in the production of work of highest quality.

The Ansco 11 x 14 Professional Printing Machine is designed for general use. It is easy to install, economical to maintain and uniformly dependable as to light.

PRICES and full description of this Printer and other Ansco professional apparatus for photographic studios will be mailed on request.

ANSCO COMPANY
BINGHAMTON, N. Y.

NEW YORK 129-131 West 22nd St.
SAN FRANCISCO 171-173 Second St.
CHICAGO 308 N. Michigan Blvd.
TORONTO 347 Adelaide St., W.

THE PHOTOGRAPHIC JOURNAL *of* AMERICA

REGISTERED IN THE UNITED STATES PATENT OFFICE

NEW SERIES: WILSON'S PHOTOGRAPHIC MAGAZINE

AN ILLUSTRATED MONTHLY DEVOTED TO THE SCIENCE AND ART OF PHOTOGRAPHY

THE OLDEST PHOTOGRAPHIC MAGAZINE IN AMERICA
Founded 1864

Incorporating:
The Philadelphia Photographer The Photographic World

THOMAS COKE WATKINS, Editor

CONTENTS FOR JULY, 1920

Photography as a Means of Artistic Expression 251
Architectural Photography . . . . Arthur G. Willis 253
The Psychology of Photographic Portraiture . . . . A. Lockett 258
Editor's Table—Having a Settled Policy—Things to Strive For 263
The Studio—Practical Papers on Studio Work and Methods 266
Views and Reviews 271
The Workroom 275

YEARLY SUBSCRIPTION, in advance, postage paid, United States, Mexico, Cuba, Philippines and Porto Rico, $2.00; Canada, $2.35. Countries in the Postal Union, $2.75. Single copies, 20 cents.

REMITTANCES may be made at our risk by money order, check, draft, or registered letter.

SUBSCRIPTIONS begin with current issue.

Published by EDWARD L. WILSON COMPANY, INC.,
THOS. C. WATKINS, President. 701 Arch Street, Philadelphia, Pa.
EXECUTIVE and EDITORIAL OFFICES, CAMERA BUILDING, 122 EAST 25th ST., NEW YORK CITY
HOUGHTON'S, Ltd., London, Eng., Agents for Great Britain
American News Co., Distributors for U. S. Kodak Australasia Ltd., Sydney, Agents for Australia
RICHARD HILL, Devonport, Auckland, Agent for New Zealand

Entered at Philadelphia Post-office as Second-class Matter

This is one of a series of sketches on Leading American Photographers.

American Photographers

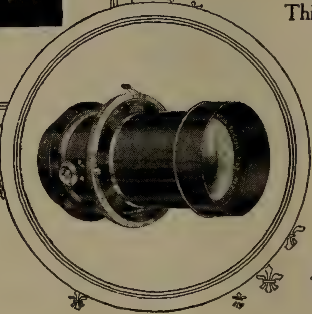
PHILIP CONKLIN—Troy is often termed "The Collar City." Photographers might well call it "The Conklin City," as it is the home of Philip Conklin, a photographer of no mean ability.

Mr. Conklin started things when he won the first prize of $500.00 in the Ansco Loveliest Woman Contest a few years ago. This distinction, and other awards made him, have helped establish his reputation in photographic circles.

By a unique lighting in his portraits, Mr. Conklin has succeeded in producing a beautiful technique all his own. It is perhaps for this reason that prominent light manufacturers like to use his portraits to illustrate the quality of their products.

Mr. Conklin has tried various lenses but finds Wollensak studio objectives best for his work. Let us tell you how these lenses will help you in securing better portraits and better prices.

Our beautiful catalogue will be sent gratis on request.



The Vitax Portrait Lens F:3.8 is here illustrated. Mr. Conklin uses this and the Verito in his studio, the F:4.5 Velostigmat in his home portraiture.

WOLLENSAK OPTICAL CO.
ROCHESTER, NEW YORK.

$100.00

DEPOSITED IN A NEW YORK BANK, WILL BE PAID THE EXPERT NEGATIVE RETOUCHER THAT CAN RETOUCH A NEGATIVE WITH A STIPPLED EFFECT, EQUAL IN FINENESS, SMOOTHNESS AND REGULARITY AS IS DONE BY THE

ARTOGRAPH
TRADE MARK.

SCREEN

Pat. Pending

THE LATEST AND GREATEST LABOR-SAVING DEVICE.

For Professionals. :-: For Amateurs.

NO Time—NO Skill Required.

IF YOU WANT TO SAVE MONEY AND PRODUCE SUPERIOR WORK

SEND FOR ONE TODAY!

Endorsed by Sarony and other high-class photographers.

Sent on receipt of price: 5 x 7, $3.50; 8 x 10, $5.00

The Artograph Screen Co.
500 Fifth Avenue New York City

For Sample Photo send 15¢ in stamps

Sent Complete with Combination Pink Films that Produce Results

---

HEYDE'S ACTINO PHOTO-METER

Eliminates Guessing in Photography!!

The simplest, most effective and most accurate instrument for determining correct time for exposure.

Easily and quickly manipulated; compact and always ready for use.

No Sensitive Paper Used For Tinting

Exposure table complete on dial.

Essential to the Photographer who wants perfect pictures.

Order by mail or from your dealer.
Write for descriptive booklet.

New Vest Pocket Model
Size Dia. 2-3/8" x 13/16" Thick
Price $10.

Dealers: A postal will bring our special offer

HERBERT & HUESGEN CO.
18 East 42nd. Street
NEAR 5TH AVE., NEW YORK

By SCHWEIG
ART NOUVEAU
ST. LOUIS, MO.

The
PHOTOGRAPHIC
· JOURNAL ·
· of AMERICA ·

VOLUME LVII JULY, 1920 NUMBER 7

THE AUTHORITY FOR THE PROFESSIONAL PHOTOGRAPHER
PJA
FOUNDED 1864

PHOTOGRAPHY AS A MEANS OF ARTISTIC EXPRESSION[1]

THE question as to whether photography is entitled to be considered one of the fine arts is, to my mind, a foolish one; but if we were asked whether photography might be utilized as a medium of artistic expression I would most unhesitatingly reply in the affirmative. It might be discussed whether sculpture or painting or architecture offered the widest scope for the expression of abstract beauty, but it would be admitted by all that each of these arts is peculiarly adapted for the expression of some particular esthetic quality. Following this line of argument, I hope to be able to prove that photography is capable of expressing certain esthetic emotions very completely. That its sphere is strictly limited I am quite prepared to admit, but I consider that it is still too young an art to have its scope determined. It has not yet had an opportunity of showing what it may accomplish, largely because it has been practised by the wrong class of persons. In its early days it was taken up as a hobby by those of a scientific turn of mind, who found in the process a pleasant outlet for the exercise of their chemical and physical knowledge, with the added charm that, as a result of their operations, they obtained pictures. It is not surprising that the accredited artists looked askance at these performances, and without very much consideration concluded that the process, being mechanical, was only capable of producing mechanical results. They reasoned that only by the medium of the human hand could the divine element of imagination be introduced into a picture; but, as a side light on the probable correctness of their conclusions, I may remind you that many of the same class were absolutely assured that Whistler was an impertinent charlatan. Times have changed, however, and the present generation is producing a new type of intelligence, which combines a cultured artistic sense with a capacity for chemical manipulation, with the result that there is gradually being evolved a new art craft which is called pictorial photography. That the progress of the movement is comparatively slow is not surprising when one considers that so far the productions of the movement have not achieved any commercial status, and consequently few men of genius have been willing to apply themselves seriously to an art which promises so little in return for their efforts. I make no complaint on this score. One cannot expect the patron to anticipate the performance. The difficulties in the path of the would-be patron are obvious. By photography it is so easy to make a picture distinctly resembling a fine thing, and so comparatively easy to produce duplicate copies, that collectors are to be excused if they are chary in venturing into this new sphere of work. At the same time, I am convinced that we will never know the possibilities of pictorial photography until the reward of success is sufficient to attract the highest artistic talent into the arena of effort.

---

[1] An abridgment of a paper read before the Edinburgh Photographic Society, by Mr. J. Craig Annan, of Glasgow.

But even from the first there have not been wanting prophets who had the clearness of vision to see the possibilities of the new methods and the capacity to prove with considerable fulness the faith that was in them. The greatest of these, I am proud to say, was David Octavius Hill, R. S. A., who spent three of the best years of his life in making a noble series of photographic portraits in a studio on the Calton Hill, Edinburgh. During the years 1843-4-5 he was so much engrossed in his photographic work that he scarcely put brush to canvas, but at the end of that period financial considerations compelled his return to his work as a painter. It is an interesting commentary on the comparative appreciation of his two methods of artistic expression that, whereas he is rarely remembered even by the members of the Academy of which he was for many years the honored secretary, there is no civilized country where his name is not revered by all students of pictorial photography as the first great executant of the craft.

His compositions are of the noble order which only a great mind can conceive, and what is of special interest to us at present is, that he found his medium capable of expressing his noble thoughts. Hill had not at his command the beautiful printing methods which are now available, and I ask you to consider the possibilities which are suggested in the pictures, more than the actual results which have so far been achieved. To my mind the art or craft is still in its infancy. Hill's work proves that it had a healthy birth. It has had but indifferent foster-mothers; but I think it is now emerging into a vigorous youth, especially among a small group of our transatlantic brethren, and I sincerely believe it has before it a virile manhood. I believe the influence of Whistler to have been the most potent cause of its recent development, and in this connection I have pleasure in showing you the only writing of the master on the subject—I took the liberty of presenting him with a few reproductions of Hill's portraits and you can read his reply:

110 RUE DU BAC, PARIS.

DEAR SIR:

How very kind and nice of you to send me those most curiously attractive photographs—I should more simply say pictures, for they certainly are pictures, and very fine ones, too.

Pray accept my best thanks, for your present, and for the flattering thought that prompted it.

Very faithfully yours,
J. M'NEIL WHISTLER.

I have referred to the imagination as being the chief factor in the equipment of the pictorial photographer, and you may ask what part imagination can play in a mechanical process. It appears to me that there are two kinds of esthetic imagination: One which evolves a scheme of beauty from the inner consciousness and expresses itself in color schemes and compositions based upon, although sometimes distantly, the appearance of natural objects; and one which enables its possessor to observe the perfect schemes which nature occasionally provides, and which are capable of realization by means of apparatus and processes. The point I wish to emphasize is, *that to produce the best possible work of art in photography it is essen-*

tial that the worker should have artistic abilities of the highest order, or in other words a photographic picture cannot be of a higher order than the intelligence of the photographer.

The art of etching had a Rembrandt to exploit it in its early days, and I am convinced that the position of photography as a vehicle of artistic expression cannot be determined until it has been seriously practised by a master. Meantime, if I cannot show you the work of an absolute master, I hope to be able to show you in the series of slides which I have prepared, that something has already been accomplished.

The first is a self-portrait by Eduard Steichen, and the slide is a reproduction of what is termed a gum print. The peculiar quality of a gum print is, that at one stage of the process of production the print is in a soft state, somewhat analogous to a recently painted oil picture, and while it is in this state liberties may be taken with it by rubbing off portions of the semi-fluid picture. This process has been a very popular one with many workers during the last few years, owing to the facility which it affords to alter unsatisfactory details, but it is a method which is only safe in exceptionally competent hands, and I regret to say that many of its present-day votaries cannot be so characterized.

Interesting as these gum prints may be, I am rather inclined to believe that the most perfect work has been and will be done in pure photography, for the reason that by pure photography one may reproduce objects, with all their contours, tones, and modelling, with absolute fidelity. It follows that, if the photographer has the power to see the exquisitely beautiful in nature and is master of the technique of his craft, he has the power to reproduce on surfaces those qualities of form and tone in a more perfect way than is possible by any other method; but as soon as the hand is permitted to interfere in any way with the photograph, the automatic perfection is destroyed and the resulting hybrid picture must rely upon other qualities to justify its existence.

ARCHITECTURAL PHOTOGRAPHY

By ARTHUR G. WILLIS

THE above title, to give it its full meaning, would include the photography of bulldings of all sorts, but it is the intention of the writer to deal chiefly with work in churches, etc. where the chief aim of the photographer should be to show the beauties of the building and its architectural features to the best advantage. This is a class of work very much neglected: some of the examples of it are really awful. There is a great, and growing, demand for really first-class photographs of this kind, not only in the postcard trade, but in large prints for tourists and architectural enthusiasts, and for work to be reproduced in architectural treatises and guide books. Publishers want good work badly, but in many cases they have to put up with inferior stuff, as the reproductions show.

One reason why this class of work is so much neglected is the general, but mistaken, idea that it does not pay. As a matter of fact the class of people chiefly interested in this sort of thing are well-to-do, and do not mind paying a good price, providing that they can get what they want.

If there is a well-known church or other fine building in or near your town, make it your business to get the best possible results from it. Make it your own property, photographically speaking. Get your name known wherever the building is known, so that everyone wanting pictures of it naturally comes to you. Get your work into the guide books; it not only pays in itself, but it is a very fine advertisement. Do not stick to postcards; go in for prints for reproduction. Make a series of 12 x 10 views. Make lantern-slides in monochrome and color. Charge good prices and deliver good work.

One reason why so much bad work is turned out is this: that there is a general idea that the photography of buildings is easy. Why this is so I do not know, but anyhow, it is a mistaken idea. To do this work well requires at least as much technical skill as good portraiture, and you cannot fall back on the retoucher to patch up your mistakes.

To become successful in architectural photography one should have at least an elementary knowledge of the principles and chief styles of architecture. There is no need for a long course of study; all that is required can be learned from such a book as Parker's "Introduction to Gothic Architecture." Not only will the knowledge you gain be of great use in selecting the best views for your purpose, but it will enable you to talk intelligently with your customers. In addition the study will be found not only a profitable one, but a remarkably interesting one, especially to those with an artistic temperament, such as most photographers have.

To get to practical points. It is unlikely that, at first, at any rate, you will wish to buy special apparatus for the work, but it will be as well to point out the most useful features, in order that when new apparatus is being purchased for general work the requirements for architectural work may not be forgotten. Excellent work may be done with an ordinary field outfit, but it is undeniable that in this, as in every other field of photography, special apparatus will enable work to be done more quickly and with a higher percentage of good results. Hence when much work of a special character is to be done it is a sound investment to get the most suitable gear possible to do it with.

The camera should be of the square-bellows type. Tapering bellows are a nuisance, and the extra weight does not matter, as there is not usually a lot of carrying to be done. The camera should have all the usual movements, to a somewhat unusual degree. In the half-plate size, for instance, it should have extension from 3 to 30 inches; rise of front, of 4 inches; fall, of 1½ inches; and sliding movements of 2 inches each way. Swing front and back should be fitted, but do not use them if you can avoid it. A plumb line should be fitted to each side of the camera back, but it is very necessary to fit them properly, otherwise they are worse than useless. A spirit level may be fitted to the camera, or it may be carried loose; whichever way you use it have a "sizeable" one; the little circular levels often fitted are no use whatever. The best in use are small one-tube builder's levels.

When a square lens-panel is fitted it is an advantage to fit the lens rather below the center; by turning the panel one can then obtain a slight extra side movement of the lens, in either direction, or an additional rise. Perhaps the most important point of all in actual practice is to see that the dark slide can be inserted from either side. This is not always possible, but it is most essential when working close up to a side wall, as one often has to do.

The shutter should be of a type easy to close and re-open during an exposure, so that the ordinary roller-blind type is inconvenient. This is often necessary owing to people coming into the field of view during the exposure. The shutter must work without jar. The best I have ever used is one of the flap type, as often fitted to studio cameras.

The release fitted should be a wire one, and it should be of sufficient length to be used when the camera is perched on three chairs, or is in a similar elevated position.

The tripod should be very steady when set up, and have a good range of heights; it should also be easily adjustable for use on unlevel ground, on stone steps for example. Rubber-shod feet are good to work with, except when the legs have to be spread wide out, when they will be liable to slip. Here I must mention the most useful accessory I have ever used for interior work. It consists of a ring to which are attached three lengths of chain, with wide links. The ring is placed under the camera, and each tripod foot is fitted into a link in the different chains. This absolutely obviates slipping, however wide the leg may be spread. It is much better, in use, than the wooden bases sold for the same purpose, as it is just as useful on uneven ground or on steps as it is on the level; also, as each link provides a "stop," it is easy to adjust the legs to the exact position desired.

A tilting top is useful, especially where much detail work has to be done; it is quite a simple matter to make one oneself, but the commercial types are quite satisfactory, and not very costly. A ladder stand is a very useful article to have; not only does it simplify the getting of details high up in a building, but it is frequently invaluable for getting views of the nave, etc., without the great exaggeration of foreground chairs or pews which is so common a fault with ordinary views.

In passing, it is always sound policy to get on good terms with the vergers. It costs very little, and they can be of great use in many ways. The moving of obtrusive objects, such as chairs and benches, is one of the most obvious ones, and attendants can frequently be persuaded to let you into galleries, etc., where the public are not allowed, but from which excellent views are often obtainable.

Now with regard to lenses. It seems quite the general impression that wide-angle lenses are the ones to use for most interiors—a most mistaken idea. They should only be used when there is no alternative possible. I should put the most useful focal length for interiors at a little larger than the longer side of the plate, say 7 inches for half-plate. This will take in quite a wide enough angle in most cases and the perspective, even at the margins, will be quite natural.

When it is possible, a lens of longer focus, say 9 inches, is preferable. The longer the focus, in reason, the better the resultant picture. Whatever lens is used, it should cover a much larger plate than the one on which it is being used, otherwise the rising front will be of no use, and the camera will have to be pointed upward and the back swung into a vertical position. A most unsatisfactory business, as it necessitates a very small stop, and consequently a long exposure.

For detail work a telephoto lens is excellent, not one of the fixed-focus type. But the business of focussing details in a dark interior with a telephoto lens is rather trying. The old dodge of a lighted candle against the subject is often the best way to do it.

It is usually a waste of money to purchase very rapid lenses for interiors. They have almost always to be stopped down to *f*/11 in practice. But it is undeniable that a large-aperture lens is much easier to work with in one way; it is easy to arrange the picture, and focus roughly with full aperture, and then to shut down to your working stop to finish focussing. The habit of doing the final focussing with a larger stop than is to be used for the exposure is a bad one, as altering the stop will, with many lenses, alter the point of sharpest focus.

The question of plates for interiors is a very debatable one. Some workers use the very fastest they can get, and score in the reduction of exposures; but a fast plate cannot have the same latitude of exposure as a slow one. The practical result of this is that the contrasts in an interior view are often well within the range of a slow plate, but quite beyond one of the faster brands. When using a fast plate the high-lights are hopelessly overexposed before the shadow detail has had a chance of impressing itself. With a slow plate, both high-light and shadow may be rendered on one plate by a careful exposure and development. Panchromatic plates are an advantage in many cases, and were I tied down to one plate only I should choose a slow brand of this type. Whatever plates are used, they must be backed. Halation is usually coupled with windows in the experience of most of us, but it will be found in every well-lit interior negative; if no windows are shown it will not show much, but it will degrade the delicate gradations in the high-lights. The difference is often very marked indeed, and it is a good idea to make a practical test of this. The result will be more convincing than pages of writing can be.

Naturally, the printing process used will depend on circumstances, but to my mind carbon is *the* process for first-class prints. I know of no other process that will give the same rendering of stonework as warm black carbon on a slightly tinted semi-rough base. In fact, whatever effect is wanted, it can be obtained by carbon, without having to resort to toning, and with a guarantee of absolute permanence. But I suppose bromide will be the most generally used process, and it is a very excellent one indeed. Whatever paper is used, it must be soft enough in contrast to give full detail in both high-lights and shadows. More interior views are spoiled from excessive contrast than from every other cause combined.

Now, as to sizes. For stock views I should recommend two sizes to be run—12 x 10 and 8 x 6, and for detail work perhaps 8 x 6 and 6 x 4. I am a great believer in contact printing for all interior work. Not only is there a lot of very small detail likely to be lost in enlarging, but it is very much easier to make a good contact print than a good enlargement from a harsh, uneven negative, such as is common in this class of work. If enlargement has to be resorted to, it is far better to make an enlarged negative and print from that than to enlarge direct on to the paper.

There are three classes of prints you will have to make if you are going to "do" your building thoroughly. A.—General views, usually with fine definition, and on smooth paper, but not therefore necessarily unartistic; B.—Pictorial effects, where the general effect is more important than detail; and C.—Detail work, such as corbels, capitals, moldings, etc. In these the detail is usually the thing to go for, but they must be, so far as is possible, pictures at the same time.

In photographing interiors it is often assumed that as light always comes through the same windows the lighting effect is more or less the same at all hours of the day. Nothing could be farther from the truth. The lighting varies quite as much in interiors as it does outside, and no trouble should be spared to find out just when the view required is lit to the greatest advantage. Frequently you will find that selective lighting is the one way of making objects stand out boldly instead of being lost in the background. The different effects to be observed during a day in the lighting of one single view are numberless. As the light goes round, gets higher or lower, as the case may be, you will find some new point becomes the chief one in the composition, and perhaps the point which was at first the principal object falls back into insignificance, being almost lost in its background. As a general rule, it may be stated that in interior work the near objects should be darker in tone than those more distant. This rule is, of course, not suited for every case, but it will give some idea of the effect to look for perhaps.

One of the greatest difficulties confronting the architectural worker is to render the texture of the subject. The difference between, let us say, sandstone and marble, or between polished and unpolished stone of the same type, is great; it must be shown plainly if the photograph is to be a success, but it is a most difficult thing to do. It is hard to say how it is to be done, or to give rules for getting the effect; but it depends partly on lighting, and more than anything else on correct exposure and development. These two things are the key to success in all kinds of photography, and in no kind of work are they more essential than in this. Good definition is a help toward rendering the texture, and yet, curiously enough, some of the best prints I have ever seen in this way were taken with a soft-focus lens and were most decidedly "fuzzy." The rendering of the texture was nevertheless perfect.

Sunshine is, of course, a help in exterior work, as it gives an almost stereoscopic effect to the print if it is properly used, but in interior work it is a nuisance. There is one exception to this. When an artistic effect is wanted a patch of sunshine on a pillar or on the floor is often the means of turning a dull and lifeless print into one full of sparkle.

The best way to deal with windows is to avoid them, but when this is not possible wait until the light is as far in front of them as possible. Small windows can sometimes be covered up from the outside during the greater part of the exposure, and just given a few seconds to impress themselves on the plate. Some very fine results may be obtained in this way, but it takes care to manage successfully. The thing most likely to cause trouble is the double-lighting effect on the edges of the window and on any objects close to it.

Everyone will have his own ideas as to pictorial effects, but whatever result is sought after the lighting will be your greatest help. Soft-focus lenses are very well suited for this work. Do not try and get "artistic" effects by underexposure. Blank spaces are not and cannot be artistic. Try and get the spirit of the place into your work.

In all architectural work it is very necessary to consider the effect you wish to create. In exteriors, for example, if you want to show the dignity of a building, it is no good going a long way off and using a long-focus lens. If you do, you will most likely dwarf your subject with the buildings and trees surrounding it. Get up close, and use a short-focus lens. Get so close that you have to look up to see your subject. Then you will get a picture with an impression of dignity in it. On the other hand, if you want to show a building "nestling" among the trees, don't get close up, or you won't get trees enough. Get a long way back and use a long-focus or telephoto lens. It is in these little things that the whole art of photography is shown.

Detail work is not easy, but it is very fascinating to anyone keen on his work. High-relief work, such as carved capitals, should be taken in a soft light, but low-relief, such as some types of moldings, will need a strong side-light to make them "stand out." In detail work it is often possible to control the lighting, to a very large extent, by the use of small screens and reflectors. It is sometimes possible to use artificial light in this work, half-watt lamps if electricity is fitted, or even flash powder. In cases where details such as capitals or bases of pillars are required isolated from their surroundings a portable background should be used. Gray is the most generally useful color, but black is sometimes very effective. The use of a background is to be very much preferred to blocking out on the negative.

To come to technical details, the old adage of "Expose for the shadows and develop for the high-lights" is particularly true of interior work. You must have full detail everywhere. Don't try and patch up faulty exposures; retake them. It pays better in the long run.

Use a developer diluted to one-quarter its usual strength; it is then much easier to avoid "soot and whitewash" effects.

In detail work it is sometimes permissible to tilt the camera up or down without correcting it by swinging the back. This is the one and only exception to the rule that the plate must be vertical during exposure. Be careful of the bellows cutting off any part of the image; it is easy to overlook this when the image is very dark. The focussing screen should be the finest that can by made.

To sum up: Do first-class work, get first-class prices, and you will get a first-class advertisement for nothing.—*B. J.*

THE PSYCHOLOGY OF PHOTOGRAPHIC PORTRAITURE

By A. Lockett

OTHER things being equal, that photographer will be most sought after who succeeds in catching not merely, nor necessarily, a "pleasant" expression, but one immediately recognized by friends, acquaintances, and the world at large as distinctive of, and peculiar to, the person represented.

Hence psychology, a science of the mind and mental processes, has very much to do with portraiture; for expression is nothing but the outward sign of an inward idea or sensation, whether arising naturally and unprompted, summoned up artificially by an effort of facial control, or cleverly suggested from outside. Psychology analyses thoughts, impressions and feelings, ascertains how this one is caused, and how another may be avoided.

In an ordinary portrait we do not want to show active or energetic passion, which pertains properly to dramatic photography. Quite apart from that, however, it is surprising how many alterations are possible in what may be called the quiescent face. So slight a change as the raising of an eyebrow, a movement at the corners of the mouth, an inflation of the nostril, a tilt or drooping of the head, a flash or twinkle of the eye, an opened or compressed lip, may altogether transform a tame, commonplace portrait into one instinct with the very personality of the sitter.

There are three ways of recording expression. Firstly, by a lucky accident or "fluke," which need not be seriously considered, though it has created a few short-lived reputations; secondly, by watching attentively till the desired effect occurs, and instantly giving the exposure; or, thirdly, by making the sitter unconsciously assume the wished-for look, through adroitly-managed yet unfelt influence and suggestion. The second method is good and is probably that most in use, but it is uncertain. The third alone can really claim to be psychological. It is the most difficult to acquire, but well repays those who adopt it, and in the end simplifies their work. It is not, of course, maintained that such a system can, or ought, altogether to oust ordinary studio methods, but rather that it should be allied with these, as a valuable guide and an added power.

While some are temperamentally unable to adopt psychological means, many workers, on the other hand, already proceed along lines which may be so described, often unknown to themselves. The subject can hardly be reduced to fixed rules, but there are, at least, a few leading principles which may be of assistance, even where circumstances do not permit of their being too literally followed.

To begin with, the operator should learn to recognize the many shades of facial expression, and what they signify. This is merely a matter of close observation, experience, and common-sense. It is best studied from living subjects, not only sitters, but almost everybody one meets or sees. This should be supplemented by the hints to be gathered from paintings, engravings, and photographs. An excellent plan is to collect by degrees a classified album of different expressions. The worker should question himself exhaustively with respect to each portrait: "Of what nature is this expression? What does it probably signify? Is it bland, cynical, benevolent, gracious, supercilious, dignified, thoughtful, amused, reminiscent, perplexed, interested, pitying, demure, arch, mischievous, annoyed, strained, nervous, embarrassed, vacuous, dreamy, bored, inquisitive, impatient, reproachful, contemplative, placid, sorrowful?—or what? How might it have been caused? Is it pleasing? If so, why? Is it suitable to this particular person? If not, why not?"

Having obtained some understanding of the many feelings or characteristics capable of being indexed in the face, and the ability of precisely identifying them,

BY SCHWEIG
ART NOUVEAU
ST. LOUIS, MO.

the next consideration is how to apply the knowledge in practical work.

The operator should try, if possible, to get some clue, however trifling, to the occupations or life-story of his sitters before they face the camera. In a moderate-size town almost every notability will be more or less discussed, while local gossip will supply useful details of less important personages. Such a work as "Who's Who" is very serviceable, and even a copy of the directory is not to be despised. The receptionist, if of the right kind, might be instructed to have her eyes and ears open for any hints or indications which may occur while booking the sitting. A well-known American photographer keeps a private card-index of sitters, or people who may possibly become such, in which are noted, directly they are read of, heard, or otherwise learned, the position, attainments, amusements, little likes and dislikes, etc., of each.

When to be taken at once, without an appointment, it is helpful if the operator can get a glimpse of the sitter before the latter passes to the studio. One of our best modern portraitists has a small draped window placed in the reception room wall and accessible from the studio, by means of which he can form an advance notion of the sitter's individuality without himself being seen.

The prompting or influencing of expression may be considered under two heads, namely, the prior preparation of the studio, and any means adopted during the actual sitting. The psychological importance of environment is considerable; when it is more fully grasped, photography will have made a giant stride forward. Most people are affected, more or less, by the prevailing tone or character of any room they enter, especially if for the first time. Consider the studio as a room. Let the walls be panelled or distempered, and the floor stained or carpeted, in an unobtrusive medium neutral tint, neither lively nor dismal, which will fit in with any scheme of furnishing. Then, in a couple of minutes, by a few rapid changes here and there, the whole atmosphere, so to speak, may be totally altered. By drawing out sombre hangings, opening a dark folding screen, installing one or two accessories of fumed oak, hanging up, say, a couple of dim old oil paintings, weapons, pieces of armor, etc., the studio may be given an aspect calculated to induce a subdued, contemplative expression, should such be thought desirable. We are not referring to the setting used in the photograph, though this also may be in harmony if expedient, but to that portion of the studio which the sitter faces, and by which he or she is unconsciously impressed.

When, on the other hand, the sitter is noticed already to look undesirably solemn, which is more usual, the cue must be a sprightly cheerfulness. Bright hangings should be drawn out, a gay folding screen installed, several etchings or water-colors with wide white margins arranged on the walls, a bowl of vivid flowers (artificial ones will do) conspicuously displayed, light-colored or white furniture brought out, and so on. It is quite simple to have the hangings arranged one behind the other, so that quick changing is easy, also the folding screen might have one side light and the other dark. Even the pictures and frames could be made reversible with a little contrivance, while a partitioned-off space will serve as a repository for changes of furniture.

The immense psychological value of surroundings suggesting a glorified playroom or nursery, when photographing children, begins to be understood, and is systematically carried out by the best workers.

A single article thrown with apparent carelessness on a side table or chair, where it will catch the eye, may prove powerfully suggestive, and it is in such subtle touches that one's prior knowledge of the sitter may be turned to account. An amusing example occurs to mind of a West-Country photographer, absolutely hard-headed and impatient of what he would call "theoretical sentimentalism," and who cannot even now be brought to see how his own methods often owe their success to the very principles he despises. Gratified one morning by a visit from a distinguished general, he placed an unfolded map of the Belgian coast on a small table in the studio, thinking it might please his sitter and look creditably patriotic. Returning with the refilled dark-slides, he found the general seated motionless, intently pouring over the chart, and altogether oblivious of his entrance. The lighting fortunately suited, the wall itself formed a satisfactory background; so, needless to say, our camerist gratefully accepted the unlooked-for opportunity, quietly slipped in the slide, and made a noiseless exposure of one second's duration, with a magnificently life-like portrait as result. It will be guessed that he did not omit to drop something, to arrange his roused sitter in the self-same pose, and to go elaborately through the time-honored artifice of "taking a dummy." The ingenious worker should be able to think of many other objects which may judiciously be used, in different cases, to induce a similar forgetfulness or to awake some vital interest.

Next to the eyes, the ear most powerfully affects the mind. A simple noise may recall the master-energy and provoke tense alertness. A successful photographer of rural squires confesses to various little stratagems of this kind. He has, for instance, banished the temporary listlessness of an obvious huntsman by smartly tapping two blocks of hard wood, in rapid succession, on a slab of stone, out of sight behind the camera, when ready for exposing. This trick effect, borrowed from the cinema, seldom fails to bring instant recollection of horses galloping along a frosty road, causing the sitter's shoulders to square, his jaw to set, and a determined light to come into his eyes. In some special cases it might be decidedly worth while to utilize the charm of unseen music, martial, lively, or dreamy, as seems most fit.

The sense of smell is well known as having a strong psychological influence. Sweet-scented flowers, or a sprinkling of choice perfume, soothe feminine susceptibilities. The odor of good tobacco subtly pleases a smoker, but must be got rid of afterward, or it may annoy others. During summer and autumn a pail full of moistened seaweed, brought back from one's holiday and kept concealed close to the sitter, will evoke agreeable recollections in others of joyous afternoons on wave-swept beach or breezy pier. One may calm, also, through the sense of touch, as by spreading soft, downy cushions for the ladies, or by allowing a child to hold or stroke anything fluffy or plushy.

In everything much, of course, depends on the sensitiveness and flexibility of the sitter's face. Some people almost let you see what they are thinking of, and these, as a rule, are the most responsive to externals and to suggestive influence. Others are solid, hard, wearing a perpetual mark, and very little can be done with them.

The operator who is a good conversationalist has a considerable advantage, since it is possible to arouse interest, start a train of ideas, or, by means of association, to get pleasant memories working. But this needs great tact, and, indeed, some amount of personal magnetism. Those who do not possess these will find a retiring manner and as few words as possible the better policy.

An air of calmness and confidence is important to the operator. On no account should he seem anxious or hurried. Such an attitude is apt to infect the sitters and make them feel ill at ease. The moment of exposure should preferably not be known, though this by no means implies a recommendation of instantaneous working. In real life we do not view expression so abruptly and disconnectedly. Even the most fleeting facial change is usually compounded of several imperceptible transitions. By giving a brief time exposure, these are, as it were, averaged and blended in the photograph, which is therefore more convincingly natural. A good light and a noiseless shutter are, however, expedient, and the reflex type of studio camera has undoubtedly much merit, in permitting the subject to be kept focussed with the plate in position. In default of this, one of the various patterns of sliding attachments might be used, whereby, on pushing the focussing screen aside, the dark-slide is immediately substituted, and the plate simultaneously uncovered. It might not be out of place to insist on the necessity of keen vision in the operator, and the desirability of wearing glasses if there is the least difficulty in watching expression.

Requests to "keep still," and instructions where to direct the eyes, should be avoided if feasible, since they always have a petrifying effect. The old-fashioned "look pleasant, please," is astonishingly successful in conjuring up either a sheepish grin, a vacant smile, or a palpably insincere and overdone benignity. The right way is so to manage that the sitter does what is wanted spontaneously, though in reality skilfully humored, influenced and guided. Fancying that the operator is merely getting ready or experimenting, the sitter acquires a temporary self-detachment—and soon learns, with agreeable surprise, that all is over.—*B. J.*

PUSHERS AND PESSIMISTS

PUSHERS are usually in the thick of the business fight, producing.

Pessimists growl on the outskirts, waiting to seize upon the spoils the pushers win.

Pushers build and pessimists tear down.

Pushers blaze new trails. Pessimists travel in ruts.

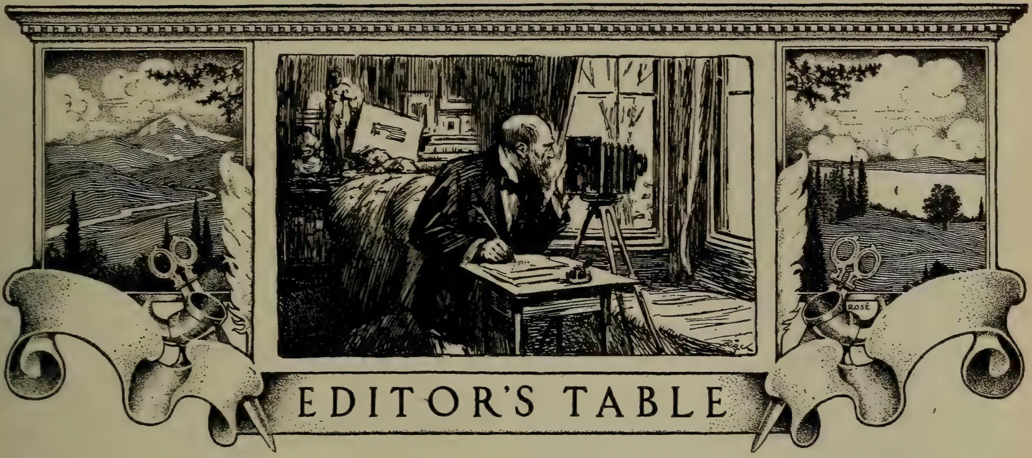
Pushers are bright, cheerful, joyous and brave. Pessimists are gloomy, doleful, grouchy and weak.

Pushers boost each other and so, boost all. Pessimists knock each other, and thus they fall.

Pushers bring prosperity. Pessimists throw blight on all prosperity.

We're going to be a Pusher.

What are you going to be—and do?—*Ohio Print.*



EDITOR'S TABLE

HAVING A SETTLED POLICY

THE varying conditions under which a photographic studio must flourish or decay, the widely differing demands of different communities and the tremendous detail incident to the carrying on of a successful photographic enterprise render system and policy particularly important in this field of affairs.

The photographer about to open a new studio should, and must, formulate a definite plan of action before he can successfully begin his work. He must decide whether his scheme shall be worked out upon the lines of large output and low prices or upon smaller production and proportionate increase in value. Until this has been done he cannot even lay out his dark-room, printing-room, or appointments. Once the policy is adopted it should be worked out to completion without any considerable change in the plan of operations until it has had a chance to demonstrate its merit or demerit.

The man who goes into photography with a wavering purpose, waiting for events to direct him, is likely to continue in a state of uncertainty indefinitely. Concentration of thought and energy can only be effective when the business is built upon a well-defined plan. The so-called art tendency in photography should be carefully considered. The photographer should firmly settle in his own mind at the outset what his own attitude is to be toward this ever-present question.

Is he to follow the dictates of the new school and endeavor to educate his patrons to a higher understanding and appreciation of art, or is he to cater to the present demands of his community, striving to produce work that is honest and of good value, with the idea of constantly improving it both technically and artistically? In doing this he may gradually build among his patrons a finer taste and a demand for better work in a quiet and natural manner.

The statement cannot, we think, be controverted that the desire of the ordinary person who goes to the photographic studio for a photograph is, first of all, to obtain a likeness. This likeness, particularly in the smaller communities throughout the country, can hardly be considered, even under the best treatment, a work of art.

Let the principles of art be applied to each and every pose so far as possible. The average photographer, however, cannot afford to forget that he is in the business for profit. He must give his customer that which the customer requires if he will succeed. In catering to the popular taste the photographer may, while apparently following the demands of his patrons, lead them step by step into an appreciation of more artistic work which, in its turn, will bring him better prices. This result may more easily be obtained by apparently following rather than ostentatiously leading his public.

To successfully work out a policy of this kind the photographer must keep himself constantly in touch with all that goes on in the photographic world, thus improving the quality of his output, keep posted upon the novelties as they appear in the market, and be ever ready to arrive at a quick and accurate estimate of the commercial value of this or that new thing among his own patrons. Once it is determined that a novelty is fitted to the demands of his own trade, he should not hesitate to adopt it. He should make it known at once in no uncertain tone throughout the entire section to which he caters. There is little or no profit to be obtained by the introduction of a new method or printing medium if it is known only to a small circle of people. If such a novelty is worth being introduced, it should be widely and strongly advertised. An innovation quickly loses its novelty. Its best results are always to be reaped while it is still new.

The progressive photographer, who is known and recognized as such, soon finds himself surrounded by a circle of patrons, larger or smaller as the case may be, whose support can be made very valuable if catered to on the right lines. Many of these people like to be considered connoisseurs. They feel complimented by being asked for an expression of opinion. The photographer with a policy takes advantage of all such means as this to extend his prestige.

If the policy of a photographic studio is to meet and satisfy the demands of its patrons those demands must first be clearly understood before they can be catered to successfully. Meantime, there will be found ample opportunity for the development of any special line of more artistic work.

The settled policy, once adopted, should be made the central point around which every business transaction groups. If the policy is built upon the lines laid down in its definition, the wisdom, prudence and shrewdness of its framer must become apparent in its results when put into operation.

THINGS TO STRIVE FOR

WE are living in an age of art feeling, and no matter how great the mechanical skill, there must be something beside it to make a lasting impression. There was a time when the photographer and his customers were satisfied with a picture which was simply a map of the human face. That day has gone by, and it is a small town, indeed, a long way from railroad communication, that will be content with this sort of work. Not only is the photographer educating himself to a higher standard, but the people that come to him are rapidly learning the value of light and shade, of tone and color qualities. They are no longer pleased with a face as white as the collar and cuffs they wear, for they realize that there is a difference in nature, and, if this difference exists in nature, then surely it ought to be in evidence in that thing which is a counterpart, or should be, of nature.

We are creating higher ideals; we are studying the work of others; getting out of the ruts of our own rut-work and seeking the things that are known to be the best in the work of others. In other words, we are teaching ourselves to see, and when once we see we will not be content until we produce the ideal in our mind's eye.

Now we know that all subjects are not good subjects. We know that the men or women who so charm us by their manner, their conversation, and by the light and shade of conflicting emotions that pass over their faces while they talk, are presenting to us phases of character which it is almost impossible to catch; but to each one there is that something which is eminently characteristic of themselves that we can catch, that can be portrayed on the sensitive plate and kept for future generations. Mind you, we do not forget the dollars and cents side of the business, which must always be uppermost in order that we may succeed. But among your customers there is always some one who will draw forth your admiration, and in whom you will recognize a subject which, if properly handled, will stamp you and your work as first-class. This is your opportunity, and you should not let it pass.

First of all, we believe that a man should be in love with his work; not in the sense that he will be blinded to the good qualities of the work of others, but really and truly in love with the profession which he has chosen, and filled with an ambition to be the best there is in that profession. It is only that kind of a feeling that will bring out the best that is in the man. Under these circumstances his faculties will always be alert, and the hours spent in the study of anything that aids him in his work will be among the most pleasant enjoyments of his life.

Above all things, *study simplicity;* try to see how little it takes to make a picture rather than how much. A portrait requires but little besides the person, and that little should never intrude. Most of the backgrounds are too fussy, too much broken up, and often too much in focus. Let your whole interest center around the face and figure of your sitter, and by all means strive to keep the picture within the plate. The shine of a row of big buttons will often detract from an otherwise delightful picture. If time will permit, talk to or entertain your patrons, at least long enough to see some peculiarity of their manner, some grace of motion which you can make use of. This will give originality to your work and call forth the highest praise; in fact, it will be like them.

Then, too, we would suggest that every photographer study all pictures that come under his notice, particularly if they be good ones. Not only do we mean prints, but engravings and paintings. Notice how the people are grouped, the accessories, light and shade, and, above all, study nature, never forgetting that you cannot represent nature, but you can approach her in a manner so like her own that people admire and applaud the close resemblance.

Study the papers and other materials you use. Do not become wedded to any one, but always bear in mind that each has its good qualities, and will, under certain conditions, be the best for you to use. Artists work under the same conditions. You will sometimes see them use a coarse-grained canvas, another time smooth; sometimes they paint with the most dainty touch, again with broad sweeps and dashes. It is that they may secure certain effects which can be attained in no other way. Find new ways to trim and mount your pictures. Always remember to keep in harmony and good taste. In fact, when you portray an old man, catch that glimpse of nature that shows what his life has been. Let us see there the struggle and triumph of honorable manhood, a life well spent, a battle well earned; or, if it be one of ease, let that show also. In an old lady let us find all that motherly sacrifice, love of children, pride of family, and grandeur of womanhood, crowned with a blaze of glory. If it be a young man, let life's hopes and ambitions peer forth from his honest eyes; let manly beauty stamp the picture as one of nature's noblemen. If it be a young woman, let beauty of soul shine forth, hand-in-hand with virtue and modesty, maidenly dreams and aspirations, together with such charms of face and form as will make the picture a joy ever. If it be childhood, there is no limit to the sunshine and shadow that can enter into your picture. Every period of life has its characteristics, and these should be sought out as expressed in the personality of the sitter, and delineated with discrimination. Bald facts are rarely pleasing. Justice should be tempered with mercy. But there is always something in every face which will please and attract if we can draw it out in our portraiture. Strive in all you do to hold the mirror, as it were, up to nature.

Thus will photography join hands with her sister arts, and if we all do the best that is within us we will call forth the praise of all men.

PRACTICAL PAPERS ON STUDIO WORK AND METHODS

On Finding and Fitting a Studio

THERE are quite a number of young men just now, good operators or all-round assistants, who have been demobilized and returned to the ranks of photographers. No doubt quite a number of these contemplate later on utilizing their savings and gratuities to start in business for themselves. Many, however, have very wisely gone back to their berths as assistants, with the purpose of making up the leeway caused by five years of army life, for not nearly all of them have been in the photographic sections, and we all know how soon, in such an individual business as photography, the eye loses its knack of judgment and the hand some of its cunning.

These preliminary months can, however, be turned to vastly good use, and, indeed, are almost indispensable to the starting of a sound business, for there are many points that need much careful consideration beforehand, and if not carefully considered are apt to be paid for in very dear experience.

The first matter of importance is the seeking for and finding of suitable premises. If the studio is to be run by artificial light, this matter is much more easily settled than if for daylight work, and sometimes it is possible to effect a sort of compromise between the two at far less expense than is necessary if a studio must be built. Often a large, long room can be conveniently utilized by adding extra side light, and if lofty enough, electric light for the top, provided it is movable.

Now, this matter of position should be faced and considered at the very outset, for it has a marked effect on the after success or failure of the photographer. After years of experience, I find it is most generally conceded that it is better to sacrifice a good many things, and pay a good deal higher rent, for the sake of a good central position in a good business thoroughfare.

Cheap, roomy premises in a side street are usually dear at any price to a photographer who has to make his way and establish his name, and it is most often the side street man who degenerates into the mere hack-worker, who barely earns bread and cheese, and is never free from debt and worry.

This matter of the "position" of premises is a singularly subtle one, and ought at the outset to receive a good deal more attention than it does, both care and attention being needed before a final selection is made. Even in these days of scarce houses, it is worth while to wait even six months or a year for what is felt to be a really superior spot for the class of work aimed at.

Try first to make a rough mental selection of the spots you would consider most suitable, in your mind, and then for a few months keep a good eye upon them and try and glean all the information you can about them. Outside information is often most useful, for it is really surprising the shades of difference that will be found in the kind of business done by firms in one single street. Often one end contains much higher-class shops than the other, or one side will be much busier than the other, which contains more dwelling-houses, and so on through many shades of prosperity, and it ought to be your aim to get a site in the part most suitable for *your* standard oi work.

It is better to pay $250 or $300 a year more in rent and be in a spot where your work comes in steadily, and is seen by many, than to be in cheaper premises, and have only too much time on your hands to worry about where the rates and taxes are to come from. Yet many rash people have opened studios and never really considered this till it was only too painfully forced home to their minds. Another important point to think of before taking your premises is, what show can you make? If already you have an established name it doesn't matter quite so much, but it is really one of the photographer's chief means of advertisement. If at all possible, get a window to yourself, and if not, see that your entrance is suitable to show-cases and well lighted. A very narrow passage will not allow the passing of sitters or window-gazers if a pram or cycle is standing there, and this can make itself a very serious inconvenience.

If the daylight is not good, and the entry a dark one, see that your electric light is good and makes up for it. Do not grudge this; it is a wise expenditure. The matter of stairs is a consideration, for they are somewhat of a bugbear to elderly or infirm folk, rather less so, to children, and should be kept well lighted.

Now, bearing these points in mind, finally weed out from your list those premises that are least suitable and turn your attention to the remaining ones that, roughly at least, "fill the bill," and see how far their internal arrangements suit your needs. If it is for electric light only, of course your needs are more easily met. But what do you need?

Firstly, your shop or rception-room, whichever you choose to call it; then, at least one dressing-room (for it is one of the most inconvenient things in the world to have no dressing-room, and causes much loss of time and patience), or two if possible, as they need not be large; then the studio; a finishing-room, for the spotters and retouchers, a room for trimmings, mounting, stock, etc. A dark room for developing negatives—which again need not be large—and a separate dark room for making prints, enlargements, etc. If there is a spare room it could be given to the retoucher for the sake of the better light.

These seven rooms represent the chief essentials for a business in full working order. They may, of course, be modified, adapted or increased as the necessity arises, but I think it will be admitted that all are wanted where all work is to be done on the premises. A corner of the studio will, of course, need to be fitted up as a changing-box, to save time.

Now, knowing just what you require, keep a sharp eye on all the really suitable premises, for good sites certainly don't go a-begging in these days of house and shop shortage.

Another thing to consider carefully is this: if you meet with an otherwise perfectly suitable site, but the size or number of rooms available are too small for you, and yet the position is otherwise all that you could desire, would it not be better to close with the offer and make use of the trade houses for a good deal of your after-work? There are several points here that present themselves. You can probably fit up a dark room where you can develop plates, and perhaps you yourself will do the proofing and retouching until such time as you may engage a retoucher, which is not by any means always done at first. Then, a trade house will turn you out the highest quality of prints, such as you would need a first-class printer and enlarger to secure. Thus you will at first be saved this expense. Also, they will undertake mounting and finishing if desired, and many even of the oldest-established firms now rely upon them for enlarging and coloring. Thus the purchase of an expensive enlarger can be saved for a while at any rate, whilst good coloring is really a specialist's department. Also, it will set the owner free to devote himself to unhurried, unworried operating—which any experienced operator is aware counts for a lot in the results—and the building-up of his business, with its hundred and one minor matters that all call for time and attention. Thus, it will often pay a young man starting in business best to sacrifice working room to a commanding position. This, of course, is entirely a matter for individual decision, but still it demands a good deal of careful thought before definite action be taken, and it is too late to make a change. Also, later on, it is often possible to secure more rooms in the same block where there are sub-tenants. This, of course, is a case of patience and waiting until the desired opportunity occurs.

Having then leased your premises, you must next have electricity laid on, if not already installed, and see that sufficient is available to meet your needs. Now, over this I would like to add a special and very necessary caution. The insurance companies who take risks are fairly particular about electric fittings, and if not in accordance with their requirements they both can and will repudiate a claim should a fire occur, as a fair number of photographers have from time to time found out to their cost. So it is better to spend a few dollars extra in the first instance and make yourself secure, or you may find that the best companies decline to accept you, on the ground that your installation is not in accordance with their requirements for normal safety. The electricity companies should, of course, put this before you, but they don't always, so that too many "home-made" fittings don't always pay, though I have nothing against them in the main. In any case, where the premises are old, or there are wooden partitions to be wired, it is far safer and cheaper in the long run to have the cables run through small iron pipes, which will give you an easy mind and entirely satisfy the insurance folk. By the way, they ought also to furnish you with a list of the prohibited chemicals, which, when kept, invalidate the fire policy, unless kept under certain conditions, for which provision should be made in the first instance, as I believe flash powder is one of them. It is as well to invite the local representative of the insurance company to come and look around for himself and see that the conditions fully satisfy his company. I know of two instances where the owners got next to no compensation for a fire, as flash powder had been kept in wooden cupboards.

If, as is nearly always the case now, you intend to use electricity to aid daylight, see that sufficient current is available, and whether any cheaper rates are applicable to you, as is sometimes the case in large towns, especially after certain hours; in the course of a few years it totals up to a big difference. See to all these matters before you start decorating or fitting, as if everything is not just right it may mean tearing up your nice, freshly laid carpets and linos to get at floor and skirting boards.

If your premises have already a proper shop-front, it only remains for you to adapt it to your needs, but if you are putting in a window there are one or two things to consider.

The question of one big window or two smaller ones is and will remain a vexed question—that is, unless you are also going to deal in amateur supplies, in which case two separate windows are almost essential, to avoid clashing and maintain the fitting standard of display. Also this question affects the class of work you wish to cater for, and this must be *the* guiding principle in your mind throughout, for you must lay yourself out for what you want, and as far as possible see that you get it.

If you aim broadly at one fair, middle-class standard of work, one window will serve you very well, but if, on the other hand, you aim to do also a certain amount of better-class work, then I should say have two windows, most decidedly, and keep the two kinds of work rigidly separated, for there is no doubt that they appeal to two quite separate sections of people, and you will serve each best by keeping them apart; and, indeed, I know one studio well where one dressing-room is fitted and apportioned to one class of sitter with more elaborate fittings and toilet accessories, and the other and more simply furnished for the more average run of clients. This by the way.

If you are putting in a window, it is as well not to have the bottom of it too low, so that people have to stoop to see clearly what is in it, nor should it be too high, or it will not do the specimens justice, for they will be shown under a bad, false light during the daytime. From 2½ to 3½ feet from the ground is a very fair average height, depending, of course, upon whether the floor inside the window drops much below the street level.

Then there is the matter of ventilation, which is most important, for a badly ventilated window has a knack of ruining the best of specimens. No window should ever be put in without a steel ventilating grid at the top. An unventilated window, especially if cased in, is a vile trap for heat, flies and dust in summer, and in the winter will "steam" to such an extent that no one can possibly see through it, and the streams of water that trickle to the bottom will ruin mounts, plush or anything that is in the window, as the moisture condenses.

If you intend showing much in the way of post-cards, locket-rims and small stuff, it is best to have your window shut in at the back, with sliding glass panels, for on a main street this saves a good deal of labor in dusting window specimens, and keeps the window looking fresher, though for very high-class work it is perhaps hardly suitable. But where amateur materials and cameras are stocked it is quite essential. But care must be used, in enclosing a window, not to make the reception-room darker than can be avoided. Careful provision must be made for lighting the window at night and in the winter months, electric light, of course, being best and cleanest. No light should shine straight out into the eyes of anyone looking through the window, but be carefully screened and thrown into and down on the window itself and its contents. Some prefer the big, enclosed lights outside over the pavement, which do indeed throw quite a lot of light into a window, and also form a source of attraction to window-gazers outside. These, in both incandescent gas and electric light, seem to be coming increasingly into favor. If electric light is used inside, it should be arranged on fairly long flexes, and then from time to time these can be lengthened, shortened and altered to give changed effects of lighting. If it should be desired to show lantern plates, Autochromes or color transparencies, this is particularly useful, as the light can then be arranged behind them, diffused and shown through, and color work now has a big future before it.

The bottom of the window will need covering, and for this purpose a variety of things are used, plush seeming to be rather the favorite. Where, however, the bottom of the window is likely to be fairly well covered, it could be stained and varnished, or covered with a good, plain cork lino of a soft, harmonious color. If the window is enclosed at the back, care should be used to see that there is plenty of room to get into and out of the window, as if the panels are too narrow it will be rather difficult to get a large framed enlargement or easel into or out of the window without either personal injury or putting one or the other through the glass of the panel back. I know that these are all trifles, but, if badly made or carelessly arranged, they can be very aggravating trifles, and under the Workmen's Compensation Act the photographer would be liable for any injury so caused to errand boys or assistants, apart from the fact that it makes window-dressing awkward and difficult.—G. E. H. G. in *B. J.*

Little Dodges

THERE are a lot of little dodges that are a big help about the studio and I hit upon one that has been a big help to me, so I am going to pass it along.

I happened in the studio of a friend I had not visited for a long time, and the subject naturally drifted to film, which we are both using. After looking over a number of film negatives and a lot of prints from these negatives, Smith began asking me about how we handled our orders and negatives, etc., and we seemed to check up pretty well on methods, but I had to confess, that he has me beaten on one small point, and that was on numbering negatives.

He laughed when I mentioned this point and said he would show me his numbering machine when we looked through the workrooms. We finally reached the dark-room and this machine was pointed out to me. It certainly was a crude bit of apparatus, but it did the work, which was all he asked of it.

First of all, it made perfect, clean-cut, transparent figures in a narrow strip of black background at the very edge of the negative, and the numbers never ran over into the negative as they sometimes do when we write them on with a pen. This is the way it was done:

The receptionist makes out an order slip for each sitting, and in the upper left hand corner of the slip, printed in black ink, is the serial number of the order. This is the number that is placed on the negative.

An opening had been made in the dark-room bench where holders are loaded and unloaded, and into this opening, a box had been fitted flush with the top of the bench. In this box, which had been rigged up by an electrician, was a small ruby bulb and a larger clear glass bulb. The wiring was so arranged that when a wall switch was turned on, the red light would burn continuously and when a button was pressed the white light would flash on and then off again when the pressure was released.

The box was properly ventilated, beneath the table. In the top of the box a small glass window had been made, covered with black paper, except for a narrow slot about three-eighths of an inch wide.

When the light was on, the slot was red, but when the second switch was pressed, the light was white. When this much had been explained, in much less time than it has taken me to tell it, Smith closed the dark-room door and took the order slip from several loaded holders. He placed the slip face down over the slot so the order number was centered over the slot. The red light was strong enough to make the figures quite plain. He then took a film from a holder and placed it against a guide which brought the number on the very edge of the film about an inch from the side. While the film was held in contact, the button was pressed and the white light made the exposure that printed the order number on the film margin.

Placing the order slip face down reversed the figures so that when printed the number could be read from the emulsion side of the negative.

I am having order slips printed on fairly thin white paper with the serial numbers in good black ink, as I think this is one of the best little stunts I have ever seen. It not only makes a very neat job, but it makes it quite certain that the number on the negative will correspond with the number of the order.—*Photo Digest.*

The Height of the Camera

It is not sufficiently realized by some operators how much the height of the camera influences the expression and character of a portrait. When a sitter has been placed in the best position, and the lighting arranged to suit the particular type of face, there are still many modifications which can be made by tilting the camera upward or downward. These changes in the position of the camera alter the perspective of the lines of the face and body, and make a difference in the general appearance of the portrait.

Pose a sitter with his head quite level and his eyes fixed on something the same height as the camera. Now lower the camera and tilt it upward, and you will see that, although the sitter has not altered his position, the head appears thrown back and the eyes turned upward. Then raise the camera and tilt it downward, and you will see that the head appears bent forward, the forehead broader and the face more pointed towards the chin.

When you take a head-and-shoulders portrait of a small man with a large bald head, don't have the camera too high—unless you want to emphasize the fact that his head is out of proportion to his body and that his hair has disappeared. On the other hand, when you photograph a stout full-faced man with a receding forehead, don't have the camera too low—unless you want him to look more like one of our savage ancestors than a man of today.

Then again, in taking full or three-quarter length figures, you can make a sitter look shorter or taller by raising or lowering the camera. A high point of view will fore-shorten a figure and give a squattiness to the portrait. This should never be done unless a sitter is abnormally tall and thin. A low point of view will make a sitter look taller. It is extremely useful to remember this when you make portraits of sitters who are below the average height. As a rule, sitters are very sensitive on matters relating to their stature; so much so that very often proofs are accepted or rejected simply because they please, or fail to please, on this particular point.

When children playing on the floor are photographed from a high point of view the charm of the picture is often destroyed by the fore-shortening of the figures. To avoid this the children can be placed upon a platform. But very few professional photographers nowadays will tolerate a cumbersome platform in their studios. The alternative method is to use a studio stand such as the Century Semi-Centennial, which allows the camera to be lowered to within fifteen inches of the floor.

These points in the manipulation of the camera become second nature to the careful operator who has made a close study of perspective and who applies this knowledge to his daily work.—*Professional Photographer.*

An Outline of a Workable System

"A place for never-a-thing and never-a-thing in its place," would be a more applicable rendering of an old-time proverb in the case of some studios I have visited.

There may appear much liberty about such a free-and-easy style, but the time is bound to come when it is dearly paid for by perhaps an hour's search of a single article, with all its attendant irritation. On the other hand, what compensation will result from a little self-imposed discipline in the pleasure of finding things just ready to hand when wanted.

Many and various have been the systems put forth. The writer, however, had adhered to none in particular, but as hitches have occurred (and they will) the point has been considered and a plan arrived at whereby the same hitch would not occur again, and, if workable, it has been included into the daily routine.

To begin, then, the system greets the sitter from the very outset, though behind the smiling face of the receptionist. All names, as well as addresses, together with the order, are systematically entered and numbered in the book for that purpose. It might be observed such a thing is too obvious to mention, yet the case of a money-making photographer comes before the mind who never kept books at all, and therefore never even the sitter's name. The number of copies required and amount paid was just penciled on the plate in the dark-room, and the photographs themselves served to distinguish between one order and another.

A good look at the photograph was followed by a scrutinizing glance at the caller in order to ascertain if the features were identical. But alas! for the chaos that resulted from such lack of system.

Proofs, then, are promised by a given date. Exposed plates are put into boxes, labelled for every day in the week on which they are taken.

When busy it is not always found practicable to develop the day's takings the same evening. It is convenient therefore to be able to put your hand on Monday's or Tuesday's and develop and proof according to promise.

The number, order and date promised is transferred from the book to the negative, the proof now returned confirming these details.

The negatives, when re-touched, are placed just where the printer will look for them, under a label showing what process and if contact or for enlarging.

A large paper bag is kept for prints requiring to be toned, labelled "Sepia."

The prints are pressed every morning and entered roughly in a printing book, showing the number of prints done and any over or spoilt.

A dispatch book is handy for reference in the case of callers or delay in post.

Another very important item is to have a nest of pigeon-holes alphabetically arranged, similar to what is seen at the post office, where all photographs "to be called for" are placed. Finally, when putting a thing out of hand put it just where it will be looked for when wanted. The observance of this rule will save time, temper and talk.—*Photo Lore.*

Spacing the Portrait

A GOOD deal of the pleasing effect of the portrait depends upon the spacing in relation to the dimensions of the card. We have seen many an excellent picture injured by improper spacing, and lamentably, not because the artist was not conversant with the principles of taste or devoid of good judgment in the matter, but from an unaccountable predilection to conform to a certain cult of photography which advocates the crowding of the figure into crampness. The figure often is made so large for the contracted dimensions as to suggest it were necessary to squeeze it into the limitations.

There is a happy medium which should be observed in the adjustment, and it is equally objectionable to have too much area about the figure so as seemingly to lose the subject in the surroundings.

Where this latter mistake may be made, an opportunity, at least, is afforded for correction by use of the knife, and the disadvantageous surrounding environment may be eliminated to the artistic health of the subject, but in the case of crowding, there is no remedy by patching up and extending the too contracted background. An erect figure with the head downwardly inclined ought always to have sufficient space at the top to allow (in our imagination, of course) the privilege of getting up without provoking the suggestion of danger of bumping against the top. Indeed, we think that all stooping or kneeling subjects should have space enough to allow of their standing up if so inclined. Why, anyhow, should the photographer give this impression that his art necessitated him to pack his model as if in fear of encountering breakage? Wherefore the need of economy in the distribution of space?

We have often sought to divine why such styles are adopted, and have come to the conclusion that it is a case of the fox who lost his tail and tried to persuade his fellows that abbreviation of this member contributed to personal attraction.

It is strange how mannerisms in art originate from some undesired limitation imposed upon an original and resourceful mind by the necessity of conditions. Because some painter of renown commissioned to fill a space not specially designed for the exhibition of his work, taxes his resources to give the best presentation of the subject possible, and succeeds, is no argument in support of the practice of mere copyists for attempting the same where limitations do not persist, or to flaunt their skill as evidence of their originality, simply because of conformity to the work of the masters.

We think that this mannerism of introducing figures apparently too large for accommodation in a small dimension panel originated from the necessity imposed upon the old German masters, who were constrained to be economical in material. We have numerous pictures by Albert Duerer which show the head of the figure crowded in the space, and also pictures by many other engravers of the time and after, who followed in his wake.

With Duerer and the rest of them, to be just, it was not from any desire to affect singularity, but because in those days the graving tools were rude and it was difficult and expensive to procure wood blocks of good size, and so it became imperative to design the figure as large as possible, within the small compass, when so demanded. The habit thus acquired spread to the practice of drawing upon paper and also to painted canvas until it was acclaimed meritorious. The modern style of decorative painting, copied from the Japanese, of cutting off a part of the picture, be it figure or landscape, by the edge of the frame, is most deplorable, because there is no reason for it, artistic or economic. Yet this "stunt" has been seized upon with avidity by the photographer, who adopts anything because it is novel —a sort of jazz art.

Now, just stop to think, why should the figure have any interest outside the margin? Art is a presentation or suggestion of the actual—at least, photographic art should so be—and, when the subject seems to step beyond its limits, it produces incongruity. The school of Japanese art has afforded some good suggestions, but why slight the good features for preference in copying the mannerisms and conventionalities which cannot possibly have any influence upon candid taste in art? —*Trade News.*

VIEWS AND REVIEWS

The High Spots of the 1920 Convention

What are the high-spots of the 1920 Milwaukee Convention?

1. *A Completely Fitted-up Studio*, in which the regular work of the studio will be carried on for several hours a day. Expert receptionists, under the supervision of Miss Mamie Gerhard, our third vice-president, will be in the reception-room and will tell how they handle their customers and sell them pictures. In the camera-room there will be a number of our leading photographers—one at a time, you know—who will work just as if they were in their own studios. The laboratory (sometimes known as the dark-room) will be fitted up with all the latest conveniences, but the laboratory will be for show only, as it will not be practical to put it into actual use. This is going to be a big feature. It will be arranged so that everything being done in the different rooms can be seen comfortably by all. We will tell you more about the Studio in the various photographic publications.

2. *Artificial Light.* Very complete demonstrations in the use of the various artificial lights now on the market. There is more inquiry about the use of artificial light than about anything else these days, and your Board has taken this into consideration and will give the matter full scope. It will pay you to go to this convention if for nothing else.

3. *The Interstate Trophy Competition.* The affiliated associations are invited to compete for a Trophy, in value $250, which will be given to the best display of photographs sent in by these organizations. The rules require that not less than forty and not more than seventy-five pictures be hung by each association. There must be at least twelve separate exhibitors in each collection, and not more than six pictures may be hung by any one exhibitor. Three judges from States which are not yet affiliated with the P. A. of A. will pass on the collections and pick the winner. The Association that wins the Trophy twice will be its permanent holder.

4. *The Picture Exhibition.* This is open to every member, whether active or associate (employe). Three judges will be authorized to select not to exceed twenty of the best pictures hung and award them salon honors. The exhibitors receiving salon honors will be asked to give their salon pictures or duplicates of them to the permanent collection of the P. A. of A., but this will not be obligatory.

5. *Review of Pictures.* Several well-known photographers will be engaged to give part of their time reviewing pictures for any exhibitor who requests their services. Each reviewer will be assigned to a certain screen and will be on hand at that screen at stated hours. This to be in place of the usual written criticisms and rating.

6. *A Comprehensive Display of Materials*, etc. Practically every manufacturer of photographic material and apparatus will have exhibit space in the big arena, and certain hours will be set aside each day when there will be nothing doing to interfere with your thorough inspection of the goods displayed.

7. *Commercial Photography.* Under the supervision of Mr. Kaufmann of Kaufmann & Fabry, of Chicago, one of the best-known commercial firms of the country, there will be a special room, fitted up completely for commercial photography. Mr. Kaufmann will have the assistance of several expert commercial photographers and will have several sessions during the convention week. All who are interested in any way in commercial work will be invited to make this room their headquarters. Mr. Kaufmann intends to get the interest of the commercial photographers in this convention and in the P. A. of A.

8. *Demonstrations and Lectures.* The Board intends to make the demonstrations of genuine value. Each demonstrator will be picked for some special ability he or she displays in some certain line of work. The demonstrations will be different and the platform will be fitted up to the ideas and requirements of each demonstrator, so that they will work under the most favorable conditions. The lectures will be few but distinctly worth while. Full particulars will be given as time goes by.

9. *Some One Will Get All Expenses to the Convention Paid.* As the Manufacturers' Exhibition Hall is very large and some of the exhibitors will be further away from the entrance than others, it has been planned to ensure as far as possible that every one attending the convention shall visit every manufacturer's booth. Each manufacturer will be supplied with cards on which will be printed one letter only—a different letter for each manufacturer. A complete collection of these cards will spell a given slogan. The one handing in the complete collection of cards and giving the nearest correct answer will be given his or her entire expenses at the convention, including railroad fare.

10. *The Entertainments.* No convention is complete without plenty of amusement. These will be exceptionally good. On the first night (Monday) there will be the official reception by the officers at the Hotel Pfister; dancing, some entertainment, refreshments and general get-together. On Tuesday night there will be the grand ball in the magnificent ballroom of the Milwaukee Auditorium, where the convention will be held

On Thursday night there will be the annual banquet. A full orchestra, a very high-class entertainment, and carnival features will ensure this evening being long remembered.

The Ladies' Auxiliary, of which Mrs. W. H. Towles is chairman, and Mrs. Frank Chambers secretary, with Mrs. Charles L. Lewis, wife of our president, the hostess, will look after the comfort of the ladies and probably prepare some special entertainment for them.

This is a rough outline of what you will see and hear at the Milwaukee "Better Business" International Convention. There will be lots more doing and, best of all, you will have the chance to renew old acquaintances and make new ones.

You'll be wanting to kick yourself all over the lot if you miss it, when your friends come home and tell you what a wonderful time they had and what a lot of new ideas they gleaned.

Oh, yes, here is another high-spot:

11. A prize of $50 in gold to the studio employe who gives in the best suggestion, idea, device or appliance for use in simplifying the work in the studio, whether in the reception-room, camera-room, laboratory, printing-room or finishing-room. The best ideas offered will be given from the platform at one of the sessions. The board believes most thoroughly in giving our associate members a full share of this convention.

If we think of any more high-spots we will announce them in the various photographic publications. Watch out, from now on, for all announcements, and *begin now* to get ready with your picture exhibit and your plans to be there. By the way, the method of hanging the pictures alone will be worth making the trip to see. Remember August 23 to 28.

Sending to Exhibitions Abroad

SOME of our readers will be sending photographs, very soon, to the London and other exhibitions abroad. It may be of interest to them to know that, according to a ruling of the post-office authorities, if it is not stated otherwise at the time of handing in their exhibit, it will be understood this will go as printed matter, under which photographs are classified; and in case the package exceeds in dimensions 18 x 18 it will be returned to the sender, with stamps cancelled and lost. If, however, it is stated that the package is to be sent by parcel post, a declaration card is given to fill out, marked "parcel post," which can be made out in a couple of minutes, and the size may be up to 40 inches, and no further trouble will be experienced.

Applications de la Photographie Aërienne

By L. P. CLERC. Doin et fils. Paris, Price 7 fr. 50.

THE author has for some time enjoyed an enviable reputation as one of the leading French journalists, and under his editorship we had for some years *La Photographie des Couleurs* and *La Revue Scientifique*, the best of the European magazines. Quite recently he has taken up the class of work so efficiently carried out by him in the latter of the above two journals, namely, the abstracting of the photographic literature for the French Society of Photographers.

In this work we have the outcome of his experiences as commander of the section of aërial photography in the late war, as regards the actual application of photography, and we are promised a later volume of the technic.

The work deals with the interpretation of aërial photographs, the evaluation of the heights of objects, the effect of artillery, in the first part, and then treats in a thoroughly scientific manner with aërial stereoscopic work. In the third part he considers metrophotographic work and the reconstitution of prints from constituent negatives taken at various heights and angles, with all the necessary mathematical formulas to correct the obliquity of the angle of view, etc.

The book will become an authority of that portion of the work of which it treats, and the only fault one can find with it is the extremely small scale on which the plans and photographs are reproduced, which makes it almost impossible to decipher the same.

This forms one of the series of the *Encyclopedie Scientifique*, published by Doin, and which promises to be one of the best series in any language.—*E. J. W.*

Bild und Film im Dienste der Technik

By A. LASSALLY. Wilhelm Knapp, Halle a/S.

THIS is, on the whole, an extremely disappointing work. The first part deals with roll films, and in a perfunctory sketchy manner, which leaves one with the feeling that there is absolutely nothing to be learnt from it. Apparatus and processes are described, but we would defy anyone to learn how to develop a film or do much else with it.

The second part deals with cinematography, and one has here also the same wishy-washy, indefinite semi-authoritative chaff from which it is difficult to sift out a few grains of wheat.

Das Pigmentverfahren

By J. M. EDER. Wilhelm Knapp, Halle a/S.

THIS is the third edition of the second part of the fourth volume of Eder's *Handbuch*, and although published out of its turn it is none the less welcome, particularly on account of the record of past work being invaluable. This volume does not fall behind his others, and it deals with the general chemistry of the bichromate salts in photography, their history and various uses, and thus deals with the carbon process on paper and glass in monochrome and colors, ceramic enamels, gum bichromate, ozotype, ozobrome, oil and bromoil and the various modifications. Even such processes as hydrotypy and the imbibition process for color photography are dealt with, and it winds up with the powder and photomechanical processes. Practical working details with all the various modifications suggested by anyone are included, so that the work is not only of great help to the practician, but of inestimable value to the historian or would-be patentee.—*E. J. W.*

Be Kind to Your Eyes

For an organ the loss of which is one of the greatest misfortunes known the eye is more thoroughly abused by the average person than any other.

The trouble is "that the possessor of the normal eye," says an expert on the subject, "does not take into consideration that in nearly all work, as in reading, retouching, focussing, the eye is actively engaged, as well as the hands and brain, and that the eye only is at rest when looking into space or when closed."

Scientifically adapted spectacles, care to secure the right kind of illumination, and systematically resting the eye are the means of preventing eyestrain. Some of the local symptoms of eyestrain are: A sense of fatigue in the eyes, or a constant sense of discomfort in the eyes which is increased on using them, and which may be accompanied by severe pain in the back of the head; a sensitiveness to light, red, irritated, and inflamed eyelids; a twitching of the eyelid or a smarting, itching, burning and watering.

Persons whose work necessitates much ocular labor should vary their duties with intervals of rest. The simplest method of doing this is to fix the gaze on some distant object and frequently close the eyelids "is the advice of an expert."

All of the stated facts should be of interest to photographers; but the question is, how could a photographer that sits down and retouches all day follow the expert's advice? How could an operator, who makes sittings, and focusses all day, follow the advice of the experts?

It is here, where plain common sense, without expert advice, should dictate and that is to procure a perfected mechanical device, that does the very finest retouching, which no expert will equal, without the use of your eyes and without loss of time, or using any skill; the Artograph Screen (Patented in U. S. A. and other Countries) takes the place of the expert Negative retoucher. The manufacturers offer one hundred dollars to the expert retoucher anywhere in the world who can only equal (he does not have to beat it) and retouch a negative with a stippled effect, equal in fineness, smoothness, and regularity as is done by this wonderful device, The Artograph Screen.

The operator who works under the light and focusses all day, should investigate and send for full particulars of the Artograph Focus Hood, patent applied for, fitted with a lens that enlarges the image on the ground glass, see in one fraction of a second whether it is sharp, without eyestrain and without the old style focussing cloth. The full particulars are sent by mail, upon request, and without cost, by the Artograph Screen Company. Address in Adv. in another page of this issue.

"Practical Retouching"

Practical Photography, No. 9, edited by Frank R. Fraprie, has been put into a revised and enlarged edition by the American Photographic Publishing Company. Written for the amateur, the author explains to the student how to make a retouching frame, how to acquire the best lighting effects, the right kind of pencils, brushes, retouching fluids and the right kind of "stroke." Several paragraphs are devoted to preliminary practice, etching, pencil work, the lines of the face, high-lights, modelling and other difficult points in the art. The book is illustrated with portraits and charts.

All the Year

The all-the-year photographer. The one who keeps busy all the time and recognizes the fact that this is the way to do business and not to work night and day for one month just before Christmas and then loaf or half work the other eleven months.

Now photographs are just as desirable in the spring as they are in the winter, and just as desirable in the summer as they are in the spring. The fact of it is, that the warm days will soon be here and ten to one, half the photographers have still last fall's style of cards in their show cases. They are not prepared to meet the demand for the style of picture that is wanted at this season of the year. You cannot expect business unless you make a bid for it. Go out after it, dig it up, make a display of photographs that will create a desire for photographs and be always everlastingly at it. The man who does not expect much business during any certain month of the year, you can rest assured, will not get any more than he expected. The less the demand, the greater the need for advertising and hustling.

Just as soon as a photographer learns that the photographic business is a business for twelve months in the year, they will begin to make money and they will talk entirely different from what they do at the present time. Talking dull business does not bring in $ $ $. Going after business and getting it is the one thing that counts. This is an ideal time to show all kinds of summer pictures—reunions, views, "cirkut" pictures and to get the people interested for your summer business. Go after the business and be in position to take care of it when it comes.—*Ohio Photo News.*

Photographing Idle Farms

The Department of Agriculture of Pennsylvania is taking photographs of idle farms in Pennsylvania. These pictures will be shown in an attempt to get the people back to the farms by exhibiting the good buildings and equipment. A good idea.

Photographic Star Images

Dr. C. E. Kenneth Mees, director of the Research Laboratory of the Eastman Kodak Co., Rochester, N. Y., gave an address at the meeting of the British Astronomical Association, on April 28, on the nature of photographic images. Various points were raised that are of importance in the application of photography to astrophysics. Thus in the extra-focal determination of stellar magnitudes it was demonstrated that stars of different colors might have their magnitudes arranged in a different order, according to the exposures given and the developer employed.

Magnified sections of films were thrown on the screen, showing that with some developers the image of a luminous object caused an elevation of the film, but with other developers a depression. In either case the film in the neighborhood suffers strain (sometimes to the point of cracking), so that images of faint stars near a bright one are subject to displacement. Prof. Turner noted some time ago an apparent displacement of a star near a *réseau* line which was probably due to this cause. It is possible to minimize the effect by a judicious choice of developer. The address contained many other hints of a practical nature; it will be published in the *B. A. A. Journal* for April. The Astronomer-Royal, proposing a vote of thanks, said that photography was the only way of obtaining information about the fainter stars in bulk. While some of the phenomena described by the lecturer were a little disquieting, the careful analysis of their origin and effects could not fail to be of great value.—*Nature.*

Aphorisms and Assorisms

1. Some photographers know so many developing formulæ that they can't make a decent negative.

2. The speed numbers on plate boxes and on shutters often indicate exactly the same thing—disregard for truth.

3. Enlarging has its uses, but you can't make a flea look like an elephant by magnifying it. You only make it look a worse kind of flea.

4. If you think you can make a photographic process fool-proof it shows that you don't know all the kinds of fools there are.

5. When trimming prints, try to persuade yourself that a set-square is as good a judge of a right angle as you are.

6. Many photographers who feared that their early prints might fade live to be afraid that they won't.

7. The best plates in the world are those the advertisement happens to be talking about.

8. When some photographers put their head under the focussing cloth they are hiding the least efficient part of the outfit.

9. If you are dancing around trying to get great pictures with little trouble the best thing you can do is to reverse.

10. Our own best photographs are the result of rare technical skill and exceptional artistic ability; other people's masterpieces are lucky flukes.

11. A man may know all there is to be known about the theory of light, but a smart boy with a meter can knock him out on the question of correct exposure.

12. It's a lucky lens that wears its own cap.

13. When you see a genius with long hair, don't suppose you will be a greater genius just because you let your hair grow longer than his. Genius and long hair may sometimes be co-existent, but they are not identical.

14. A lens does not cover a plate any better for its advertisement covering a full page.

15. If you want to be original, be natural; you are the only one of yourself. If you want to be a mere imitator, remember the apes.

16. Many look at their prints and spend money on mounts and frames for them; whereas if they looked properly they would see a chance of a saving in fire-lighters

17. Some photographers trust to luck when giving half-second exposures with a camera in the hand; others trust a tripod. The former curse their luck; the latter forget to bless the tripod.

18. Don't hunt for sentiment in a print till you have taken the spots out.

19. While some wait for photographic opportunities others hunt for them.

20. If a man says there are faults in your prints, respect him; if he says there are none, suspect him.

21. Spare the knife and spoil the print.

22. When you feel that you are only a very ordinary sort of photographer you have the consolation of knowing that you won't be lonely.

23. You must make mistakes before you make masterpieces.

24. A rich tone in a print does not conceal the poverty of ideas in its maker.

25. There is often not enough in our photographs because we have put in too much.

26. If you call a print an "impression," don't be savage if people forget that there are such things as good impressions.

27. When you see a good negative, don't ask its maker what camera or plate or what particular developer he uses. If you are seeking for information, ask him what size in hats he takes.

28. Before you find fault with a camera try to make one.

29. Don't brag about the number of good points in your prints. You never heard a hedgehog boasting

30. It is not the plate-maker's fault that you use a dusting pad.

31. Take care that the back of your print is not preferable to the front.

32. Don't sneer at the photographer who wins a medal. You may win one yourself some day.

33. Many photographers call themselves beginners when they have not begun to begin.

34. An expert is one who tells other people how to do things he can't do himself.

35. There is no need to waste a deal of time explaining to people that you are only a novice at photography. Show them your work.

36. It is harder to make the best of a bad subject than the worst of a good one.

37. Never look a gift lens in the iris.

38. (Wellerisms.) "I'm off!" as the bellows said to the camera front. "Out, out, damned spot!" as the retouching pencil said to the pinhole. "You're a stranger to me!" as the print said to its title.

39. You need not pass an examination in advanced chemistry to enable you to distinguish between sulphuretted hydrogen and lavender water.

40. Don't despise cheap apparatus. It by no means follows that it is the man with the best gun that brings down the most pheasants.

41. A dark-room is often too dark, and a light filter too light.—*Amateur Photographer.*

The WORKROOM

CONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

Removing a Film From a Cracked Negative
Methods and Formulæ
Carbon Prints on Metallic Supports
Artificial Lighting
Handling Undeveloped Plates
A Quick-drying Packing
Photographing Animals
Sulphide Toning
Panchromatic Plates for Ordinary Work
"Clouding" Portrait Negatives
Bromide Wrinkles
For the Junior Operator
Covering Power
A Wooden Sink
Glazing Prints
Castile Soap in Ferrotyping
Some Simple Copying Hints
Photographing Glass, China and Silverware
Guide Negatives and Prints
Red-chalk Tones
Two Fixing-baths
Local Bleaching and Dyeing in Two-color Photography
Avoiding Troubles
How to Make a Really Good Developing Dish
Dark Studios

THE WORKROOM

By the Head Operator

Removing a Film From a Cracked Negative

It sometimes happens that a negative of value becomes cracked in such a manner that the glass only is broken, not the film. There are several ways by which the difficulty of printing from such a negative may be overcome so as not to show the crack. One method in particular is the insertion of a piece of albumenized paper or good tissue-paper between the face of the negative and a piece of clean glass plate the size of the negative, then binding the two together with strips of gummed paper. The best results are obtained by this plan when albumenized paper is used.

Sometimes more than one crack is produced in a negative, in which case the difficulty of utilizing such a defective plate is greatly increased.

Many times the question of how best to remove the film and retransfer it to another glass plate has arisen. One difficulty—if not the most important, has presented itself, namely, how to penetrate the substratum which holds the gelatin film composing the negative, so as to release it from the glass support, because the substratum is generally a compound of gelatine and chrome alum, which is harder and more adherent to the glass than the gelatin film. This is often noticed when cleaning old negatives with hot water and carbonate of soda. Although the film dissolves from the plate perfectly, the substratum still remains in patches in such an adherent form as to require the use of a knife to effect its complete removal.

There is a method of accomplishing this without the use of either hot water, soda, potash, or of strong mineral acids, none of which is certain in its action.

The process here to be described is one of great simplicity—one that can be used with certainty by any person, the solution employed being quite cold, and the application of heat being quite unnecessary. In fact, the colder the solution the better the result.

If the negative is a portrait and the face has been retouched, it will be advisable to remove the retouching with a tuft of cotton moistened with turpentine and cleaned off thoroughly. This, however, is not absolutely necessary, for a film can be removed just as well with the retouching on as if it had been removed. Whichever plan is adopted, a small amount of retouching will be required after retransfer. One point in particular must be attended to: the trays used must be thoroughly clean, and only hard rubber or composition trays can be employed, for reasons which will be explained. The bottles that are to contain the stripping solutions must also be quite clean. In fact, use new ones so as to be quite sure of this. The results will repay those who undertake this extra trouble.

The composition of the chemicals given below is the same as that known as "Magus." It is not only simple, but sure and certain in its action. Prepare the two following solutions in two separate bottles:

No. 1

Fluoride of sodium	½ oz.
Water (ordinary)	16 oz.

Cork this bottle, shake well, and mark "No. 1."

No. 2

Citric acid in powder	1 oz.
Water	16 oz.

Shake this well, cork it, and mark "No. 2."

Have at hand a clean glass plate, say 6½ x 8½, in a tray of clean, cold water. If the negative to be stripped is 5 x 7 it should be transferred to a 6½ x 8½ plate, so that if the film is not placed quite truly, it will be a very easy matter to cut the plate to the right size after the film has dried. To strip the film from the cracked negative, take 4 fluidounces of No. 1 and pour into a tray of hard rubber, 6½ x 8½; then add 4 ounces of No. 2. Rock the tray so as to obtain complete admixture of the two solutions. Then immerse the negative, film side uppermost; carefully rock the tray, first endwise, then crosswise. Allow it to stand for half a minute, then rock again. It will now be seen that the film is frilling slightly at the edges. Rock the pan a little. Now, with the forefingers and thumbs of each hand, lift the film clean off the cracked plate, place it in the water above the clean glass plate, lift the plate by the two top corners, and adjust the film so as to leave a clean margin all round. Lift the plate and film together by the top, and drain slightly. Lay the plate in a horizontal position and carefully adjust the film so that there are no air bubbles present. See that the film perfectly adheres to the glass support. Then, after draining off the excess of water, allow the transferred film to remain in a horizontal position until dry. Never allow the drying to take place with the plate in a vertical position, for the film may become split. There is just enough tackiness upon this side of the film to admit of its adhering firmly to the glass plate. By this method of transfer a valuable negative may be saved for future usefulness.

A very useful adjunct for this class of work is a very thin *soft* squeegee. With the aid of this handy tool the transferred film may be set down very evenly upon its new support and the excess of water removed at the same time.

It may be advisable to make a trial or two upon some discarded negative before attempting the transfer desired. This will give the practice and confidence necessary for the final operation.

The process will appear marvellous to those who have never performed such an operation. The true action is this: When any acid is brought into contact with fluoride of sodium (citric acid in particular), the element flourine separates from the sodium base and attacks the glass surface through the porosity of the film. By this means the adherence of the gelatin film, together with its substratum, is released, the film being then easily lifted. At the same time the citric acid combines with the sodium to form citric of sodium, which remains in the water. Several negatives may be stripped in the same solution, but the solution will not keep. After use it should be thrown away.

If it is desired to enlarge the film after stripping, simply allow it to remain in the clean water for a minute or a short time longer, then proceed as before to attach to the glass plate. Caricatures are easily produced by this means—by stretching the film unevenly. The face or any part of the figure in a portrait can be easily distorted, and it remains permanently so upon its support.

The reason for using hard rubber or composition trays instead of glass or porcelain is to avoid their being attacked by the liberated fluorine, which would also lessen the action upon the negative.

Methods and Formulæ

Writing on a Negative. All that is required is a little ordinary copying ink. The required wording is written with it with a pen on clean white paper, the size required, and is allowed to dry. Then after soaking the negative in clean water, the surface water is blotted off the film and the writing paper is squeegeed into close contact with it. Dampening the back of the writing paper before squeegeeing onto the film is a good plan. After the lapse of about a minute the paper can be taken off and the writing will be found to have transferred to the film.

Cleaning Glass and Porcelain. An effectual solution for cleaning photographic glass and porcelain dishes which have become badly discolored is made of one ounce of bichromate of potash dissolved in ten ounces of water. When thoroughly dissolved add slowly one ounce of commercial sulphuric acid. Stir with a glass rod and be very careful not to get any of the acid on the hands or clothing, as it burns quickly. In cleaning the trays use a swab tied to a stick, and throw away after use. The best plan is to clean one's trays with soap and water each time they are used, for the once using cleans off very easily and avoids stains which have become set and impossible to remove. Stains from the developing of gaslight prints may be removed by substituting nitric acid in place of sulphuric. The sulphuric acid solution will also clean bottles stained from the storing of chemicals.

Varnish for Bromide Prints. The following water varnish has been recommended for giving increased depth and richness to bromide prints. A hundred and fifty grains of borax are dissolved in five ounces of boiling water, and the solution has added to it—

Shellac	300 gr.
Sodium carbonate . . .	50 gr.
Glycerin	2 dr.

After boiling for ten minutes the mixture is allowed to go cold, and then has five ounces of wood alcohol and a quarter of an ounce of pumice powder added. It is well shaken up, allowed to stand for three or four days, the clear liquid being decanted and filtered for use.

Carbon Prints on Metallic Supports

GENERALLY, when the photographer desires to produce carbon prints upon a metallic support, especially upon a bright and highly polished surface, he employs a preliminary coating of normal collodion, this coating being relied upon as a substratum or go-between with the metal plate and the carbon print. This is especially so with a plate of copper that has been coated with silver and highly polished. For the production of carbon portraits upon bright copper or highly polished silver surfaces, the use of collodion is not necessary. Carbon prints upon metal surfaces are invariably produced by single transfer, so that the developing is made direct upon the metal. If the plate should be made of brass, nickel-plated copper, or a bronze of almost any description, then it is advisable to use a preliminary coating of collodion. This is necessary because of chromic acid which forms the base of the bichromate of potash (used to sensitize the tissue), attacks the zinc contained in brass, or the nickel coating on copper, or any nickel alloy combining with the nickel or zinc and liberating copper in a free state, giving spots and patches of copper upon the surface. Collodion being an inert body, acts as a neutral layer upon the surface of the alloy.

The preparation of the carbon tissue does not differ in any way from the usual practice. A very good sensitizing solution for the carbon tissue to be used may be prepared as follows:

Bichromate of potash (c. p.) .	2 oz.
Distilled water	50 oz.
Glycerin	15 dr.
Salicylic acid (dissolved in hot water)	15 gr.
Carbonate of ammonia . .	40 gr.

When the above are completely dissolved, filter the solution through absorbent cotton and sensitize the tissue by immersing it for three minutes. Squeegee the tissue down upon a clean sheet of glass, then suspend it to dry in a ventilated and darkened room. Having the tissue ready, it may be kept for use in a printing frame larger in size than the tissue by placing in the frame a piece of thick sheet glass covered with black paper. Put in the tissue, replace the back of the frame, and keep the tissue under pressure.

If it is desired to produce a grained surface upon, say, a plate of copper or aluminum, proceed in the following manner: Clean the copper-plate well by dipping it into and rubbing it with a small rag-mop dipped in a solution of lye. This solution is made by dissolving a small quantity of potash lye, about four ounces dissolved in one quart of warm water; allow it to cool off before use. The copper-plate must be planished and polished previously. Having cleaned the plate with the potash lye, wash it well and dry. When dry, brush the back of the plate over with shellac varnish or asphaltum varnish. Allow to dry in a warm place. The plate should be handled by the edges only, the fingers not being allowed to touch the surface. The surface of the plate must now be rubbed well with a stick of charcoal, such as is used by photo-engravers. Dip the plate and charcoal into water; lay the plate upon a smooth board, inclined over a sink, so that in rubbing the surface backward and forward, the surface grinding drops into the sink. The graining is produced by immersing the well-cleaned copper-plate into a mixture of

Nitric acid	1 oz.
Water	20 oz.

If the graining is to be coarser, the water must be reduced to fifteen ounces. In the course of a short time it will be seen that the surface of the copper has been attacked by the acid. Rock the tray a little, and in the course of a minute or two remove the plate, rinse it in running water, then scour the surface with a fine brass wire scratch-brush. This can be done by hand, or, if possible, use the rotary scratch-brush in a scratch-brush lathe of a silver plater. The object of the scratch-brushing is to rub down any slight burr formed by the etching of the acid. The plate may now be washed by dipping into hot water. It will dry by its own heat.

If aluminum be employed, hydrochloric acid (muriatic acid) must be used instead of nitric, because nitric acid will not attack aluminum except at a high temperature. The proportion of hydrochloric acid may be the same, with the addition of half an ounce of common salt. This lessens the intense action of the acid. The scratch-brushing must be resorted to as before, rinsing the plate, dipping into hot water, and drying.

Assuming now that a carbon print has been produced upon the tissue in the usual way, all that is necessary will be to take the copper-silvered, or aluminum plate, and dip it in the lye. Rub lightly with a soft cotton mop, rinse in clean water, and as quickly as possible soak the exposed tissue. Dip the tissue and metal plate into a syrup composed of

White granulated sugar. . .	1 lb.
Water	1 pt.

This solution must be used only in a cold condition.

Place the soaked tissue and plate together; cover with a piece of India-rubber cloth, glazed side uppermost; place upon a level surface. Now apply a squeegee, lightly at first, then gradually increase the pressure at every stroke, not rapidly but with a slow, heavy pressure. If several plates are used, some bright, some grained, the treatment is the same. Allow the plates to stand for fifteen or twenty minutes before developing. At the end of that period place them in cold water, allow to soak for a minute or two, then transfer them to a larger tray containing warm water. Rock the tray so as to get rid of the air-bubbles on the surface. Take the first tray, half fill it with water of a somewhat higher temperature, take one of the metal plates out of the warm water, immerse it, then carefully lift the tissue from one corner. All that will be necessary now will be to throw the warm water over the surface of the plate with the right hand while holding the plate in a sloping position with the left hand. In a very short time the print will be fully developed. Wash it by dipping into clean, cold water; then immerse it in alum bath compound of

Common alum	2 oz.
Water	100 oz.

The plate must remain in this bath for not more than five minutes, because the film should not be hardened too much.

Proceed in the same way with the other plates, and after the alum bath wash them by laying them in clean water from tray to tray, giving five minutes time to soak, so as to completely remove the alum. They then may be placed in a clean rack to dry.

Carbon prints produced upon bright silvered plates have very much the same effect as daguerrotypes, with this exception, the portrait may be seen at any angle, hence they have often been called daguerro-carbons. Prints produced upon aluminum have an exquisite velvety effect, being at the same time absolutely permanent.

Artificial Lighting

A PREVALENT idea among photographers, experienced as well as beginners, seems to be that the use of artificial light differs in some mysterious way from that of daylight. To a certain extent this is true, because in working with the former the source of light is usually small and more skill is needed in arranging it. Broadly speaking, the elementary principles of lighting are the same whether daylight, electric or flash-light be used, and if any difficulty be experienced in using artificial light it arises from these principles never having been grasped.

In the first place, the tyro must never lose sight of the fact that moving the sitter is equivalent to moving the light, and that it is much easier to move both sitter and camera than to alter the position of the lamp or lamps. As an example, we will suppose that a full-face portrait is required, and that when the model takes his seat the lighting appears flat and without character. This may be remedied by turning the face away from the light when shadow will at once appear. From the original position of the camera we have now a three-quarter view of the face, which is not wanted, so that we move the camera in the same direction, until we again obtain the full-face view. If the shadows are rather too heavy the reflector is used, due care being taken not to give the impression that a second source of light has been used. Injudicious use of the reflector destroys the modelling on the shadow side of the face and obliterates all its characteristics. If there is excessive shadow under the eyebrows, nose and mouth it indicates that the light is falling too vertically upon the head, to remedy which the sitter must be placed further back from the light, while if the contrary be the case he must be brought forward.

A common fault is overlighting; that is to say, the face is so flooded with light that all delicate gradations are lost and the lighted side of the face appears flat and dense in the negative. This is due either to insufficient diffusion or to the sitter being placed too near the light; the remedy for this is obvious. It may be said that as a rule artificial light installations, as sent out by the makers, are inadequately supplied with diffusing arrangements, the idea being apparently to make them capable of giving results of some sort with the shortest possible exposure. A simple test for diffusion, when ordinary soft effects are required, is to hold a piece of white card in the position likely to be occupied by the sitter, and to observe upon it the shadow of an ordinary pencil or stick. If this be at all sharply defined further diffusion is necessary.

Although some forms of electric lamps are more convenient than others, there is no reason why, with a little study, good results should not be produced by any of them. Enclosed arc, open arc in reflector, mercury vapor and half-watt incandescent differ widely in appearance, but if properly controlled will produce negatives which are indistinguishable from one another. Half-watt lamps, if of high candle power, require much the same treatment as the enclosed arc; it is much better to use several smaller lamps when a thin white calico diffuser in front of each will be found sufficient. For very soft results a butter muslin head screen will be found useful. The small round diffusers issued with the orthodox reflectors are insufficient, except for strong effect, and allow light to escape at the sides, which may cause fogging if allowed to reach the lens.

Whatever form of light is chosen, the lamps should be capable of being raised or lowered. If permanently fixed sufficiently high for full lengths, they will be too high for sitting figures and children, the distance causing the exposures to be needlessly prolonged. If several lamps are used each should be provided with a separate switch, so that only as many as are actually needed are kept running.

The beginner will do well to keep before him as a guide a good photograph, showing the style of lighting he wishes to produce, to arrange his lamp reflectors and diffusers until everything appears to be correct to his eye, and to note their positions carefully. Then and not until then make an exposure, which should be developed and printed for comparison with the guide photograph. If not quite satisfactory a second trial should make it so. This operation should be repeated with various styles of lighting until all are mastered. A little systematic work of this kind will do more to secure good work than months of haphazard exposuring and making alterations without any clear idea of what they will effect.—*B. J.*

Handling Undeveloped Plates

Many operators have a habit of taking exposed plates out of the slides and putting them in a plate box until they are ready to develop. There is nothing wrong with the idea, but the way the plates are laid in the box makes a great difference. The first plate should always be placed in the box, glass side down. This prevents the emulsion side from coming in contact with any chemical dust or moisture that may have been taken up by the pulp board of which the box is made.

When you lay the first plate in the box glass side down, and the second plate glass side up, with nothing between the two, you bring the emulsion sides of the two plates together, and they will be perfectly safe until you are ready to develop them.

Traces of perspiration and chemical impurities are transferred from the fingers to the backs of plates during handling. These marks from handling will do no harm if the emulsion sides of the plates are always packed together. But if the first plate is laid into a box emulsion side up, and the next plate the same way, the emulsion side of the first plate comes in contact with the finger marks on the glass side of the second plate and these marks are offset on the emulsion. When the plate is developed, the marks sometimes show as distinct fingerprints and sometimes only as irregular opaque blotches. Bare hands never come in contact with either the glass or the emulsion side of a plate in manufacture or packing. The plate makers and packers wear clean gloves and they handle plates entirely by the edges. Plates are always packed in the boxes face to face and back to back.

Handle them the same way in your dark-room and you will not have any of your negative ruined by fingermarks.—*Professional Photographer.*

A Quick-drying Backing: How to Make and Apply it

It has been so frequently advised that all exposures should be made on backed plates, that one might have expected that halation would now be a trouble of rare occurrence; but unhappily this is not the case, and perhaps the extra charge made by manufacturers for backed plates has a good deal to do with this. As backing is not a very expensive article to make, this extra charge is, no doubt, chiefly due to the extra manipulation required in the application of the backing, so that the amateur may save himself considerable expense by taking this not very heavy work upon himself. The objections will probably be raised that it is a dirty operation, and that the plates get fogged, especially during the long time occupied by the ordinary backing in drying. The object of these notes is to show how both the mess and the fogged plates may be avoided. First, as to the backing itself; the points to aim at in the manufacture of such a preparation are:

1. That it should really prevent halation.
2. That it should dry quickly, and when dry should not powder or drop away from its support.
3. That it should be easily removed by an application of cold water.

After a considerable number of experiments, I have found the following formula to meet the above requirements almost perfectly:

Caramel (solid)	1½ oz.
Burnt sienna (in powder)	1 oz.
Soap mixture, about	1½ oz.

The caramel may be made at home by heating white sugar till completely liquid and blackened, when, on cooling, it will set into a dark, brittle, glassy mass. The soap mixture is best made by mixing together, in a bottle, 1 ounce of finely shredded Castile soap and 3 ounces of wood alcohol; this mixture should be allowed to stand for some hours, then the bottle should be kept immersed in water as hot as the hand can bear for half an hour, being frequently shaken during this time. The undissolved portion should then be allowed to settle, and the clear liquid poured off. To make the backing, the caramel is first powdered in a mortar, then the powdered sienna added, and the two well rubbed together. To this powder sufficient of the soap mixture is then added to form a mixture of creamy consistency. At once the best and most simple method of applying the backing is to hold two plates together, face to face, and paint on the backing with a fairly large camel-hair mop. By using this method the plate is protected from the action of the dark-room light by the backing, and so fog arising from this cause is avoided. The plates need not be coated absolutely to the edge, so the operation may be performed without dirtying the fingers. After backing, the plates should be exposed to the air for about five minutes, when they will be sufficiently dry to place in the dark slide, or to repack in their original backings. When ready for development the backing may be easily and completely removed by wiping with a damp flannel or sponge. In the case of plates highly sensitive to red it might be found advisable to substitute a black powder, such as drop-black or lampblack, for the burnt sienna prescribed for ordinary use.

Photographing Animals

Look through the magazines that are devoted to stock-breeding, farming, dog-fancying, sport and natural history, and you will get some indication of the numbers of animal pictures used for reproduction. These reproduced photographs, however, do not show all the pictures of animals that are being made. There are thousands taken for private purposes, and these never find their way into the magazines. The demand is big, so big in fact that some branches of the work take all the time of highly-skilled specialists. Some of these branches lie so far beyond the bounds of regular professional photography that no man could run them as side lines.

Nevertheless, there is a great deal of work which can very well be done by the regular professional, if he has any natural inclination for it and is prepared to give it a little earnest study.

Two distinct classes of work are required. The first is to take well-bred animals in such a way that all their good points will be shown to the best advantage. Artistic lighting, good composition and all that goes to produce pictorial effect, are of secondary importance in these photographs. The owners want pictures to show that their animals are perfectly formed and marked according to the standard of their particular breed.

This work requires a knowledge of animals. Suppose, for example, that you were asked to photograph some valuable Skye terriers, and that you knew absolutely nothing about the good points of these dogs. You could doubtless get some excellent negatives, but it would only be by the merest chance that one of them happened to be of any use to the owner. You wouldn't know that long bodies, short legs and deep muzzles were some of the points you were expected to emphasize in the photographs.

The shape of an animal's body, the length of its legs, the size of its head and the way it carries its tail will give you plenty to think about. Your negatives of animals will need as much careful treatment as those of your most fastidious lady sitters, who are so particular about their figures.

The second class of work is totally different. This is simply to make pleasing pictures of pet animals. Here pictorial effect is of great value, and more attention can be paid to composition than to showing good breeding.

What about apparatus? Most of the best known men who take cattle, sheep, horses and dogs, prefer to use a strong, rigid, view camera with a fairly long focus lens. For some kinds of work they find a hand camera such as the Graflex not only very useful but practically indispensable. Quiet domestic animals can easily be taken with a tripod camera, but restless timid ones that have to be stalked in a field can be better managed with a Graflex.

It is not wise to use a focussing cloth of a bright red material—the photographer who sets out to photograph a bull, and forgets this point, is likely to have a lively time.

Now suppose you have an order to take a valuable hunter, and that you have made yourself acquainted with the various points which the owner will want emphasized; how are you going to tackle the work? Before going any further, just turn to a professional horseman's magazine and examine the photographs of horses. In the pictures reproduced, every leg of the horses will be clearly shown; and not only that, every leg is helping to support the body—there is no crouching, no leaning and no "lazy leg" taking a rest at the expense of its brothers. Note how each horse holds its head high in the air so that its graceful neck may be shown to advantage; and note too the absence of distortion secured by selecting a broadside position and by using a lens of a fairly long focus. There is more than a knowledge of photography shown in these pictures if they are what they should be. There is evidence that the photographer has a sound knowledge of horses and that he is in sympathy with his subjects.

A good horse always looks best with as little as possible in the way of harness, bridle or other trappings, and for this reason the happiest pictures are those taken in the open field. Direct sunlight is nearly always an advantage seeing that it throws parts of the body into relief. It is a good plan to place the horse on a slight incline so that the fore feet are a trifle higher than the hind feet. This position throws the head up. To get the position of attention, with the ears pricked, snap your fingers or make some slight noise, such as rattling a box of matches.

When you understand horses thoroughly, you will know just when to make your exposure—you will know instinctively what the horse is going to do next. A full exposure is essential, also a shutter that works silently.

Photographs of horses at work, racing or jumping, must, of course, be taken with high-speed shutters, but that class of work hardly comes within the scope of this article.

Now consider cattle and sheep. When an individual portrait is wanted, the animal should be cautiously separated from the rest and driven into a corner of the field or yard. The very tameness of domestic cattle raises a curious difficulty. When you go into a field they generally like to crowd round you and thoroughly inspect both you and your apparatus. It is well to take as little notice of this as possible, because after they have satisfied their curiosity they will return to their grazing. The best time to photograph cows is just before milking-time when they are waiting about in small groups. During the heat of the day a cow's tail is nearly always on the move, and you may have to wait a long time for a favorable moment for making the exposure.

The pictorial value of cows and sheep is so well known to photographers that very little need be said on that score. It may be pointed out, however, that there is always a good demand for artistic pictures of this class and that good prices are paid for them. Also that they do not go out of style and sometimes yield good profits for years. They should always be copyrighted.

In photographing dogs, most of the suggestions given for taking horses may be followed. Watch the position of the legs and head, and—a most important point—be sure you show the tail erect, straight out or hanging down, according to the breed of the dog. To get a dog's attention, do nothing to excite him. Shouting "rats!" or "cats!" would of course, make him look lively, but it would also make him so restless that you would have difficulty in keeping him under control afterward. It is much better to get him quietly interested by letting him see you break up a biscuit. Another dodge is to imitate the buzzing of a bee; this makes him prick up his ears without wanting to jump about.

Cats are not nearly so easy to manage as dogs. They will rarely allow themselves to be handled except by their owners. A tuft of cotton tied to a piece of thread and slowly drawn along a table will generally arouse interest for long enough to make an exposure.

Pleasing photographs of kittens are always in demand for postcards and magazines. There are some professionals who have specialized in kitten photographs, and judging by the number of their published pictures, they must have made money out of it. It is not much use taking up this branch of work, however, unless you have a liking for your models, because to succeed you must be on good terms with them.

The demand for good photographs of animals is steadily growing, and the photographer who adds a knowledge of animals to his knowledge of photography is the man who will get the work.—*Photo-Digest.*

Sulphide Toning

The method of bleaching bromide prints with ferricyanide-bromide and toning in sodium sulphide is still very popular, and there is no doubt that with proper treatment the results are very satisfactory. The color produced is usually a warm sepia, while that produced by the hypo-alum bath is cold sepia.

There is, however, one point in which the hypo-alum toned print scores over the sulphide tone print, and that is in the purity of the whites.

From experiments made in our own laboratories, we find that in sulphide toning it is not possible to obtain absolute purity of the whites. The degradation is slight, and cannot be entirely eliminated, but it can be minimized by thorough fixation. Prints that were fixed in two separate baths for fifteen minutes each showed very little loss of purity in the whites, and this appears to point to the fact that the degradation is caused by silver being still left in the gelatin or its support.

Varying strengths of bleacher and sulphide did not make any material difference, but it was found that when a print was "forced" in development the whites after toning showed decided degradation. In order to produce the best results in sulphide toning it is necessary to pay particular attention to the following points:

1. Prints should be correctly exposed so that in development they reach the full depth in the usual time—"forcing" is not only useless, but sometimes causes fog.
2. The fixing must be thorough, preferably in two separate baths, and the washing must also be thorough.
3. The sulphide solution must not be used too weak.
4. Prints should not be left in the sulphide bath a moment after they reach the full tone.—Rajar, *Trade Notes.*

Panchromatic Plates for Ordinary Work

To the majority of photographers the panchromatic plate is a fearful and wonderful production, and many fail to avail themselves of its valuable qualities because they fear that the risk of fog is too great to be dealt with. As a matter of fact a panchromatic plate is no more liable to fog from white light than an ordinary plate of the same rapidity. The only difference is that being red-sensitive, it must not be exposed to the ordinary dark-room illumination, no matter how feeble it may be. It is safer to develop a panchromatic plate in a room lighted by an ordinary candle, using only light reflected from the ceiling, than by the deepest ruby light In our own practice we prefer to develop in darkness, using either a tank or, for single exposures, a dish fitted with a tin cover. The plate is placed in the dish and flooded with developer in the dark, then the cover is put on, the light turned up and the dish rocked until development is complete. We find five minutes a convenient time for development, using the solution more or less diluted as a soft or vigorous image is required. After development the light is again turned down, the plate transferred to the fixing tank, which is, of course, kept covered, until fixation is well advanced. It is as well to have all panchromatic plates backed as not only does the coating serve as a protection when filling, but it renders it almost impossible to mistake the sides when filling in the slides.—*B. J.*

"Clouding" Portrait Negatives

Arthur Whiting gives the following directions: Varnish the retouched (or otherwise) negative with what is known as matting varnish, of which the following is a good formula, viz.:

Seed lac	2 oz.
Sandarac	2 oz.
Oil of lavender . . .	$\frac{1}{2}$ oz.
Castor oil	$\frac{1}{2}$ to 1 oz.
Methylated alcohol . .	40 oz.

The addition of some powdered glass will facilitate the solution of the gums, and gentle heat usually has to be used also. When dissolved allow to stand for several hours, then decant, and filter once or twice (an advantage). Great care must be used to ensure both negative and varnish being absolutely free from dust, as it is fatal to success in this class of work. After the negative is cold rub the varnish gently down with the fingers, which have been previously dipped in powdered resin. When a uniform matt surface has been obtained wipe off with cotton-wool and keep the latter for further use, as dusting the negative with this impregnated wool is infinitely superior as a preliminary to dipping the fingers in powdered resin.

The negative is now ready for clouding, which is done with the aid of a stump (a tint-stump for broader surfaces) and some electrotyper's plumbago.

For the stump choose a very firm-pointed paper, about half an inch or more in diameter, and rotate the pointed ends on a piece of fine glass-paper until they present a perfectly smooth and silky appearance with fine points. A tint-stump can be made by screwing a small flat button on to the end of a penholder, and covering the knob thus formed with two or three thicknesses of ordinary surgeon's lint.

Place some of the plumbago upon a wash-leather pad, and work it well into the leather with the ordinary stump. When the latter is evenly charged (not too heavily) apply it over the background of the negative so as to form clouds "in negative," the best kinds for the purpose being those known to meteorologists as cumulus, cumulo-stratus, and "scud." It is important to make the highest lights in the clouds less intense than those of the features, otherwise the artistic quality of the production will be lost, and the picture look "made up." Let the work, therefore, be of a subdued tone, the highest lights equalling in depth the middle tones of the face, and placed on the shadow side of the latter. By doing so the portrait will be thrown up, and if the clouds on the lighter side of the face are only faintly portrayed, it will give the effect of light striking them after it has passed the sitter, and will cause the background to build up and harmonize with the rest of the photograph instead of detracting from it. Again, it sometimes happens (if the clothing is of a similar tone to the background) that the shoulders seem to merge into it, and when this may be undesirable it is easy to bring them into relief by clouding the latter over their immediate vicinity, any overlapping of the work being afterward erased with a retouching knife used so as to glide over the varnish without scraping it.—*B. J.*

Bromide Wrinkles

Theoretically, there is no simpler process for producing photographs than bromide printing, but one does not go far in practice before finding out that it is not quite so easy to produce good prints as it looks, quite a number of ways of spoiling paper being open to anyone of average ingenuity. I, therefore, assume that my readers are conversant with the ordinary routine of exposure, development and printing and take up the story where trouble begins.

Dirty margins frequently appear with some workers and rarely with others, showing that the manipulation rather than the material is faulty. Sometimes in the case of a vignette one finds a brownish and gray fog extending half an inch or more from the edge and sometimes the entire margin up to the image is more or less degraded. With some papers the stain is of quite a bright orange yellow, and may even extend over what should be white portions of the image itself. This defect is usually caused by forcing the development of an underexposed print, and is more likely to occur if the paper is rather stale than when it is quite fresh. It may, as a rule, be avoided by giving a fuller exposure and increasing the amount of bromide in the developer. Great care should be taken to avoid contaminating the developer with hypo; a very small trace of this will cause stains, as witness the yellow corners which frequently appear upon the corners of enlargements which have been pinned up by hypo-contaminated fingers. Those who print in P. O. P. realize what a small trace of hypo will spoil a print, but it is not so generally recognized that the same thing occurs in a lesser degree with bromide paper. It is a curious thing that a large number of people do not see that if the darkroom towel is used to dry fingers dripping with fixing-bath the hypo so carried into the fabric will later on contaminate fingers which have been carefully washed. I have repeatedly seen printers turn over a batch of prints in the fixing-bath and dry their fingers on the towel without rinsing them first, then after removing the prints to the washing bath carefully wash their hands, dry them upon the hypo-soaked towel, and start on making more exposures. Fortunately, most stains so caused will yield to the iodine-cyanide reducer, to which I shall presently refer.

A general muddiness or dinginess of the whole print is often caused by using a developer which has become oxidized either by too prolonged use or by allowing development to go on while holding the print in the hand. This is frequently seen when an attempt is made to develop a sky or other light portion of a print locally, the remainder having been slightly rinsed or even left with the exhausted developer upon the surface. Some paper makers recommend transferring the print directly from the developer to the fixer without rinsing. This carries a large quantity of developer into the hypo and dirty-looking prints will result if the hypo bath be not frequently renewed. As a rule, when acid fixing-baths are used they are overworked, and many failures in sepia-toning may be traced to this cause, the print when toned appearing to be upon cream paper instead of upon white.

Much may be done to save stained prints by using a clearing solution. I have found none so satisfactory as iodin and cyanide. To make this I keep two stock bottles: one a 5 per cent. solution of iodine in iodid of potassium, and the other a 5 per cent. solution of cyanide of potassium. For use, about ten minims of each are added to an ounce of water, the strength being regulated to suit the work in hand; more of each solution is necessary for deep stains, and less for removing a slight general fog. With practice it is quite easy to effect local reduction by using a pad of cotton-wool dipped in a fairly strong solution. I have often turned a solid print into a vignette in this way, put lights in on clouds in a sky, and even removed portions of the image from the center of the subject where a clean surface was required for working up. This reducer is the only one, as far as I know, which will act upon a sepia-toned image, but I would recommend that any cleaning-up or reduction should be done before toning, as the untoned image is more readily dissolved.

A print which is flat and heavy-looking all over may be greatly improved by having the lights brightened up with a solution of iodin followed by a plain hypo bath. To do this we take enough water to cover the print, and add to it enough of the 5 per cent. iodin solution to give a sherry color; on immersing the print the back of the paper will at once turn to a deep blue color, but the gelatin side will not change color for a minute or two. When the high-lights turn to the blue color the print is rinsed and transferred to a 15 per cent. solution of plain hypo; the blue will immediately disappear, and the image will appear brighter. If the reduction be not sufficent after five minutes in the hypo the print may be well washed till free of hypo, and the process repeated. If the iodin solution be too strong there is a tendency for the half-tones to be eaten away and the print made harsh-looking. This method of reduction has been recommended for obtaining bright prints from thin flat negatives, the print being rather overexposed, fully developed and cleared with the iodin and hypo.

The ordinary ferricyanide and hypo reducer may be used in the same way as the mixed iodin and cyanide, but there is a possibility of the reduced portions becoming a different color from the rest of the image, this being specially likely to occur when a weak hypo solution is used. I have found a clean 15 per cent. solution of hypo tinged a full lemon yellow with a 10 per cent. solution of ferricyanide of potassium to give the most satisfactory results.

To obtain good sepia tones, bromide prints must be fully developed, at least a minute's development being necessary, while two or even three minutes are needed for really rich tones. Fixing in clean hypo must be thorough, and all trace of hypo removed by washing. Even a slight trace of hypo will unite with the ferricyanide and reduce a good print to such an extent that it will not darken properly in the sulphide. Weak sulphide solution is a common cause of bad tones. If the paper will stand it without blistering, I prefer a working strength of one part of sulphide in fifty of water, instead of one in a hundred as generally recommended. Prolonged immersion in weak sulphide will not give the same result as a shorter time in a stronger solution. Liver of sulphur, or "potassa sulphurata," as it is called by the chemists, is an excellent one-solution toner with some brands of paper, but it is not suitable for others. In some cases I have been able to get any color from a warm black through various shades of brown to a warm sepia, but in others I have not been able to get beyond a purple black similar to a deeply-toned P. O. P. The process is very simple, and resembles hypo-alum toning, as the solution is used warm and only a single solution is needed. The formula is: liver of sulphur, 60 grains; water, 15 ounces; ammonia 10 minims. This is used at a temperature of about 100° F. Some papers will tone without preliminary hardening, but most brands should be treated with a 5 per cent. formalin solution for five minutes, or the film will dissolve. The toning is continuous, and the print may be removed at any stage. It should be noted that the toning continues in the washing, so that the print should be taken out before the desired color is reached. I have found that much weaker prints may be successfully toned in this solution than by the ordinary sulphide process, but the paper must be suitable.

Rusty-colored prints, which are sometimes inevitable when printing from very hard negatives which must be overexposed and underdeveloped, may be greatly improved by toning in an ordinary gold and sulphocyanide bath, as used for P. O. P. The print on being immersed in this will slowly turn to a pure black or gray, and if left in too long to a bluish slate color. It is desirable to fix in a weak hypo solution after toning to prevent any possible change of color, but I have found prints not so treated to stand very well.

Another method which I can strongly recommend is to use the ordinary chromium intensifier, which will usually transform a poor, washed-out print into quite a brilliant one. The bleaching bath consists of potassium bichromate, 10 grs.; hydrochloric acid, 5 minims; water, 1 oz.; after bleaching, the print is washed until the whites are pure and then re-developed in an ordinary amidol or metol-hydroquinone developer. It is necessary to expose the bleached print to daylight during or after bleaching or the image may refuse to blacken.—Practicus, in *B. J.*

For the Junior Operator

Good operating is the first essential of good photographs, but to be a good operator needs much careful study. At the same time, however, this study is amply repaid by the skill and certainty that it gives. Operating is in itself a most fascinating thing, and the more of it you do the more of it you will want to do, and the more successful you are the keener you will get at it, and this keenness is the best guarantee of your doing good work.

To start with, try your hand at getting good and well-lighted heads, as this is the sort of good, straightforward work that is always wanted. Aim at getting a good, clear, full lighting without any very heavy shadows at the sides or under the chin.

Then you must consider the best angle for both the head and the body, in relation to each other and to the background.

To say light for the sitter and not for the background seems needless advice; yet it is not, judging by some of the backgrounds one sees, which literally seem to hit one in the eye, so sharply are they focussed. Some of our most expert operators will keep mostly to one or two grounds, of which they get quite fond, yet to look at their work one would never think they were taken against the same ground. And how is this done, you say? Well, it is just the outcome of the careful selection of the best bit of the ground to use for each particular sitter, and putting them at the proper distance and angle against it. In this way an endless number of effects are obtained.

If your camera shows a larger picture than you need—say, a half-plate size when you only want quarter-plate—take a stout piece of brown paper and out of it cut a piece the size of a quarter-plate, then lay this mask over the focussing screen, so that you see only the figure and part of the background that you want. Study them carefully, altering a dozen times if necessary until you get just the effect that you want. And don't be satisfied until you do get it.

The thing that gives most life to a photograph is the expression in the eyes, and this will only be obtained by careful watching for the best point at which to center them. The eyes are the point which many operators like to focus on.

Reflectors also are things that need using with care. If you can do without them, so much the better. Watch the sitter while you are focussing and try to catch a natural expression, and then, while exposing, try and get it again.

You might do much worse than put in a few wet Wednesday afternoons in having a good practice on some long-suffering friend, simply using empty slides for this purpose, yet going through the whole process, right down to drawing the slide and making the exposure. I have found that this gives one much greater confidence when the trying moment of actually taking one's first sitters comes. Remember that a clumsy operator means a nervous sitter as a rule.

If you live in a small town where there are not many photographers, make a point of studying the society protraits in the magazines. This will give you ideas and keep you from falling into a rut.

Perhaps the best advice to give an operator when at work in the studio is "keep cool." Ask yourself before you expose, "Is everything just as I want it?" for sitters have a naughty way of wriggling just while you are putting in the slide. Thinking will also save you from getting two exposures on one plate—one of the sorrows of the operator's soul.

Try and make your sitter look as natural as possible, and remember that the best verdict your work can receive is "What a speaking likeness," and this is the goal you should aim for.

It is little details that go to make a perfect photograph, so look out for the details and they will be their own reward.

In trying for fancy lightings a good rule is to start with the least amount of light you can make do with, as it is always easy to increase it.—G. E. H. G., in *B. J.*

Covering Power

When the "covering power" of a lens is spoken of, two distinct meanings have to be taken into consideration, one being the diameter of the largest circle which the lens will project upon the ground glass at its principal, or, as it is more commonly called, its infinity focus, while the other is the diameter of the circle which is sharply defined. Through not differentiating between these meanings, unscientific lens users have often been disappointed. It is often said that reducing the lens aperture increases the covering power, and this is quite true if we take the second meaning, but as far as the size of the circle of illumination is concerned the contrary is sometimes the case. There are certain excellent lenses which have the diaphragm so placed that the field is reduced when the smaller apertures are used. Another misconception as to covering power frequently arises when copying. There are still many photographers who believe that when making an enlarged copy the lens used must be capable of covering the plate in normal circumstances, while the truth is that it need only be able to cover the area which is to be enlarged from.—*B. J.*

A Wooden Sink

Lead-lined sinks are costly, and so are those of earthenware, which are undesirable for other reasons; so I would suggest to those who are fitting up a dark-room that they should try a wooden sink, unlined, as I have done. Mine consists of a shallow box of deal, made by the local carpenter, with its sides neatly dovetailed and screwed. All the joints were treated with thick shellac varnish before it was put together, and when complete it was given inside and out three coats of Brunswick black, letting it dry between each. I may add that all the interior angles were filled with strips of pine cut to a curve, so that there are no corners at all, nothing that cannot be wiped down and left clean in a minute. A sink made in this way has been in constant use in my dark-room for three years at least, and bids fair to last for another three without repair or alteration.—*The A. P. & P.*

Glazing Prints

The glazing of prints, such as postcards, stereoscopic slides, and many other varieties of developed print, as well as those made upon Solio and other gelatin printing-out papers even to-day very often give much trouble and anxiety, for fear of spoiling by tearing when stripping the print from the plate, particularly when the exact number only have been made. There are three ways by which prints may be given a brilliant and lasting surface. First by a film of collodion, secondly by waxing either a ferrotype or glass plate, and thirdly, by a thorough cleaning of a sheet of polished plate such as mirrors are made of and polishing with French chalk or talcum powder, or by a thoroughly cleaned glass plate without any intermediate material at all.

The collodion process is too expensive for the general class of work, and as a superficial coating of a separate film is not necessary, the waxing process will meet nearly every requirement.

The best waxing preparation I have found in practice, the one I always use for the ferrotype plates, is compounded as given here.

Wax Stripping Solution

Pure paraffin wax . . .	160 gr.
Benzine or benzole . . .	8 oz.

The paraffin should be cut into flakes, and added to the benzine. If neither of the above fluids cannot be readily obtained, spirit of turpentine will answer. This is applied by moistening a piece of soft rag, then rubbed all over the ferrotype plate or glass plate, then polished with a soft cloth leaving next to nothing upon the plate.

The wetted prints may be laid face down upon this surface and stroked over the back with a soft scraping squeegee and dried; with plates thus prepared the prints will never stick, without the use of wax, the plates must be well cleaned, and rubbed over with a small quantity of talcum powder and well polished, or the plates may be well cleaned, and the prints allowed to soak in formaldehyde 1 ounce, water forty ounces, for five minutes, and placed directly upon the glass plates squeezed and dried. The removal of the prints is effected by wetting the back of the prints well with water and the plate stood on end to drain; just as soon as they are surface dry wet them again, reverse the position, drain again until surface dry; the prints may then be lifted by raising one corner with a penknife, and laid back down to dry.

Prints treated this way by the use of formaldehyde will come away from the plate freely, either glass or ferrotype.

For cheap work this is a rapid and efficient way both for thin and thick paper.

In my practice, 8 x 10 and 6½ x 8½ developed prints are glazed both by the waxing and the wetted back methods.

Castile Soap in Ferrotyping

In the days of printing-out paper, to get the desired sheen on a glossy print, it was customary to use a hot burnisher to polish the surface of the print. But in using the burnisher extra care had to be taken to insure a certain degree of heat, else the burnisher would not work to the desired result, the prints sticking to the roller or refusing to take the glaze.

Shortly after the introduction of developing paper, the ferrotype process supplanted the burnishing machine. But in this connection it frequently happens that the prints stick to the plates, entailing much wastage and annoyance. This condition is more pronounced in summer, during the hot, humid days.

Many schemes have been tried to overcome this tendency. The one found most satisfactory, in our experience, is the simple plan of rubbing a piece of castile soap on a dry cloth, then going over the ferrotype plate with this preparation. It seems to have a potency all its own, and whenever this process is used there is no difficulty in removing the prints from the ferrotype plates.

For commercial houses and amateur finishers, the castile soap has many advantages over the old beeswax formula, inasmuch as this process permits forced drying. There is no likelihood of the prints showing iridescence or rainbow effects, even when insufficiently polished.

Our experience is that no undesirable results are apparent from an excess amount of soap deposited on the print.

Under extremely dry conditions, with normal temperature, very little, if any, coating of any description is necessary for perfect results, provided the plates are thoroughly cleaned before ferrotyping.

This little hint is published in answer to a query recently received from one of our readers residing in Florida, and incidentally to be a guide to any of our friends who may happen to be confronted with prints sticking to ferrotype plates.—*Portrait.*

Some Simple Copying Hints

Owing to the war and its losses, and the number of men and women who have now permanently put aside their uniforms, there is an immense field in copying and enlarging for the photographer to work upon; and in order to get such work through as well and expeditiously as possible, many photographers might overhaul their working methods for copying with advantage, and bring them well up to date. This would ensure better copies being turned out more quickly than before.

For one thing, the copying easel or board might be made a permanent and ever-ready fixture. A little thought given to its even illumination by artificial light would ensure that many a slack half-hour in the dark evenings would be turned to good account, and copies would not need to be kept hanging about indefinitely, waiting for a spare hour and good daylight.

The work turned out by the trade houses and by photo-engravers is really wonderful. Photographers might well take a leaf out of their books, for it is only careful thought and planning that has brought their methods up to so high a pitch of perfection. A few suggestions, therefore, may not come amiss.

Often a print is brought in for copying, and some explanatory text matter is desired to be added to it. The usual way seems to be to copy, make a rough print, add the required wording, and copy again. Usually, something of the quality is lost in each fresh negative made. Usually the print is too precious to be worked upon or tampered with. Another method might be tried, however. Get a few sheets of the very *best* and most transparent tracing-paper or linen, mark round the edge of the print, and cut out of the sheet. Fasten on to a drawing-board, and carefully and smoothly paint all the framework of the tracing paper with that kind of opaque white paint known as "process white," as used by photo-engravers. There is a special brand made by Windsor and Newtons, which, in my experience, seems to photograph a purer and cleaner white than any other—always a difficulty when a new negative has to be made. When this white mask is perfectly dry, add the necessary wording in "process black." When dry, carefully adjust the mask over the print to be copied, cover with a piece of perfectly clean glass, bind together with passe-partout binding, and proceed to copy in the usual way. I take it for granted, of course, that a slow or else a "process" plate is used for making the fresh negative, as they give so little grain, yield so much better results, and in case of any slight error in the exposure respond so much better to treatment during development than do faster plates.

One thing I think photographers often fail to realize, and that is the amount of time that could be saved in the finishing department if only a little more were expended on making and preparing the copy negative. How often does it happen that something like the following takes place?

The printer or operator takes a negative to the retoucher: "Oh, Miss So and so, just spot this copy-neg., will you, and let me have it in a few minutes, soon as ever you can, will you?"—failing to realize that perhaps one hour of that retoucher's time spent on that one negative would save as much time spent on each one of perhaps six dozen prints in the spotting room. It is such simple logic, yet heaps of photographers don't seem to realize it. It repeatedly happens that an enlargement is first ordered, and then, perhaps, later, a few dozen contact prints; and think of the working up that might be saved if only that copy-negative had not been so rushed. Then, again, there are one or two little preparations on the market that both save time and give better results. One of these is the deep red matt varnish, which, if spread over parts that refuse to print properly white are carefully scraped away from the back of the negative to the required outline, gives far better results in a few minutes than the slow and laborious dabbing on and working down with the finger of red paint, as practiced by scores of photographers. Also it enlarges infinitely better. Then such things as Billdup makes it far easier to lighten a part that prints too dark, with stumping-chalk, and so on; while, after much labor expended on a copy-negative from which many prints have to be made, many photographers, omit the perhaps rather bothersome process of hot varnishing, but which well repays the little extra trouble in the protection from scratches and accidental damage it affords a much valued negative.

I saw a little dodge in use some time ago which struck me as being very clever. We all know the great risk there is in copying delicate platinotype and carbon prints, from which, perhaps, one figure has to be taken out of a group and part of a figure worked in. Well, the method I saw was as follows: A number of carbon prints needed this treatment, and each one was covered with a piece of the *finest* quality clear celluloid lightly fastened to it with gummed strips. The blocking out was then done on the celluloid cover with very smoothly mixed *oil*-color and finest sable brushes, so that practically no brush strokes showed. Backgrounds were added and covered up; legs added and hands blocked out in this way in comfort, and with no risk to the prints. They were then put up and copied in the usual way on non-screen plates, and I was very surprised at the excellent results obtained. Then, once the negatives were made and passed, the celluloid was very gently washed with best turps and cotton-wool and was ready for use again, so long as no scratches showed. There is also a special kind of transparent paper made for the use of photo-engravers, and called, I believe, "frisket" paper, which would probably serve the same purpose.

Where cloudy effects, etc., are wanted in backgrounds and no air-brush is available, a quick method is to use a stiff tooth-brush dipped in the required color and held bristles down over the part of the print to be covered. The bristles are then scratched toward the user with a match or brush handle, which makes them shoot out a fine spray of color in tiny spots. A little preliminary practice should be tried to get the knack of the thing, but it is really very often quite a quick way to cover a large space. Water-color, of course, should be used, made up in bulk ready for use in a saucer.

Where wording of a small size has to be put in or under a print, and is done by the finisher, it could often be better done with black waterproof drawing-ink and a pen which is fairly thick and does not smear, than by the water-color and brush method usually employed. There are also little handbooks of the letters of the alphabet in all styles of type, which are sometimes a most useful guide to the perplexed finisher, who must put dates, titles, etc., on albums of finished copies and mounts and outside covers, and all these details help to make copying both more paying, satisfactory, and easily accomplished. In the absence of an enlarger, a pantograph is a useful little tool, used, of course, with a blunt point—say a brush handle or bit of stick in lieu of the pencil, to give the exact size to which a figure should be enlarged, reduced, or photographed, for inclusion in a group and any similar thing, or for making a mask to use in combination prints, and so forth. A few thicknesses of matt celluloid are also sometimes useful when printing on bromide paper from a poor negative, when no slow paper is at hand, and will avoid intensification when this is not possible. It is so free from grain that it is better than matt varnishing or the use of tissue paper.—G. E. H. G., in *B. J.*

Photographing Glass, China and Silverware

BEFORE you take up any branch of commercial photography you should collect all the manufacturers' catalogues you can lay your hands on. They will give you an indication of the enormous number of photographs required and, at the same time, show the quality of work that will be expected from you.

Look, for example, at some of the catalogues of glass, china and silverware. You will see that the standard is very high, but that there is plenty of work for the expert. It is difficult work, and to do it successfully you must have considerable practice. There are many little dodges of lighting that you can only pick up by actually doing the work. The subject is rarely dealt with in text-books or magazines.

The main difficulty in photographing any object with a highly polished surface is to avoid unnecessary reflections. Photographers are sometimes advised to dull the surface by dabbing it with putty or some other oily substance, and, after the photograph has been taken, to clean it again with petrol and a soft brush. All this advice about dulling such highly burnished articles as silverware should be taken with reserve. There are, no doubt, instances when expedients of this kind may be resorted to; but they should never be tried without the full knowledge and consent of the customer. The most brightly polished articles are, of course, the most difficult to deal with, and they are just the ones that will not stand the rough treatment recommended. Polished silver, for instance, has a most delicate surface, and even the slightest scratch will call for a considerable amount of repolishing.

Apart from the risk of doing serious damage, the practice of dulling the surface takes away from these articles what is probably their greatest attraction; in fact, they cease to be polished articles at all. A beautiful piece of cut glass, for example, attracts attention by the way the light is reflected from the different facets or cuttings. A common method of "preparing" cut glass for photographing is to spray it all over, by means of the air-brush, with a mixture of deep blue or pale yellow analine dye, gum and water. This makes the taking of the photograph a very simple matter, but the result cannot show the transparency of the glass or the sparkle of the facets. In fact, the photograph will convey an impression of an article made of some smooth chinaware, faintly translucent but no longer transparent.

A manufacturer wants a transparent article to look transparent, a polished article to look polished, in the photograph. He cannot get what he wants if the photographer deliberately makes the bright surface dull and lifeless. It is chiefly by the way an object reflects the light that the nature of its surface is indicated.

Some means must be found, then, of reducing the reflections without altering the reflecting surface. Reflected light must be cut down as far as possible by using a yellow light-filter; and, of course, with the filter a panchromatic or orthochromatic plate must be used. Then, reflections of surrounding objects must be prevented by screening the article with calico, tissue-paper or fine muslin. This is best done by making a tunnel of white calico, similar to the one recommended last month for photographing polished furniture. The object to be photographed should stand inside the tunnel, so that all the light that reaches it will be diffused.

It is impossible to lay down a general rule which will apply to all polished articles. The beauty of some is best brought out by reflected light, whereas the essential beauty of others can only be shown by transmitted light. In these cases, where the transparency of the article must be emphasized, it is often a good plan to have the tunnel run toward a window, from which it would be separated by a piece of ground glass or tracing-paper that would serve as a background. This arrangement brings out all the sparkling transparency of the object.

Cut glass should be treated in a slightly different way. The same background may be used, but something more is wanted to show up the facets to the best advantage. A very good plan is to get a wooden box about a foot deep; take off the lid and knock out the bottom, and then line the inside with black velvet or any other smooth black or red material. Stand this on its side in front of the background, and place the cut glass object inside. Some of the facets will reflect the dark material, others will reflect the white light, with the result that the cuttings will show up clear and sharp.

Glass articles with very fine engraved work may be "prepared," quite legitimately, by rubbing into the engraved lines a little powder, such as rouge or the black powder used by jewelers, and afterward wiping and polishing the plain surfaces. This does not destroy the transparency of the glass, it simply makes the engraving stand out better—a point of the greatest importance in catalogue work.

Another difficult object, one that requires the greatest care in lighting, is a piece of painted china with a glazed oval surface—for instance, a cup and saucer or a rose bowl. In these cases, of course, there is no question of transparency. The calico tunnel may be used with a light or dark background according to the color of the china. The difficulty is to prevent the high-light from coming on an important part of the decoration. A top light is usually the best, but sometimes a side light is necessary. The drawing or perspective can be greatly helped by letting a streak of light fall on the rim of the bowl; this also helps to give life and sparkle to the photograph.

In catalogue work there are certain recognized positions for pieces of china; and much time will be saved by making yourself familiar beforehand with what the manufacturers want to show. For example, a cup and saucer must show the back as well as the front edge at the top. This means that they must be tilted a little toward the camera, or the camera placed so that it looks down on them. When you tilt the camera, don't forget the swing back.

Perhaps the most difficult objects of all are pieces of burnished silverware. Their surfaces are like so many mirrors, reflecting windows, furniture, camera—in fact everything within range. You cannot do better than stick to the calico tunnel. This will do away with the patchy appearance but will not rob the article of its brilliance. There can be no objection, of course, to dusting a little black or red powder into the lines of finely engraved parts, as already suggested in the case of engraved glass.

Probably the best way to photograph such articles as knives, forks and spoons, is to lay them on a flat board, covered with velvet, paper or cardboard. The color can be varied so as to give any desired background. The camera must be fixed in a vertical position so that it looks down upon the cutlery. With this arrangement you will need to diffuse all the light which falls on the objects; and, furthermore, the light should come from a very low point so that it strikes them on their sides. The great advantage of this method is that it enables you to make quite a number of negatives without the delay caused by fixing the objects to a wall or upright screen.

The great merit of photography is that it gives a realistic and convincing representation of the goods advertised. If a manufacturer cannot show his customers the actual silverware or glassware, the next best thing is to show them photographs of it. And so photographs are rapidly replacing the line and wash drawings that used to hold the field in all illustrated advertising. Until recently the artist had it all his own way, especially in the domain of showcards—but much better showcards are now being produced by coöperation between the artist and the photographer. A good example of this is to be seen in a recent series of cards advertising silver knives, forks and spoons. The artist designed the wording and decorative scheme, but left blank the spaces in which the goods themselves were to be shown. The cards were then laid flat and the knives, forks and spoons placed in position on them. By very careful attention to lighting, the professional was then able to obtain some very striking photographic cards on which the silverware appeared to stand out in bold relief.—*Professional Photographer.*

Guide Negatives and Prints

The best and quickest method of judging a thing, and arriving at a conclusion regarding that particular thing, is by comparing it with something else.

Whether the subject be a railway train, a tube of pigment, or a photographic negative this holds good. Comparison with other trains, tubes, or negatives, as the case might be, would prove the most satisfactory way of judging the subject's worth, for merits and faults are more noticeable —and *more quickly* noticed—when seen relatively.

It is with abstract properties or qualities, though, that comparison plays the bigger part; the *speed* of a train, the *brilliance* of a pigment, the *density* of a negative *are* comparative, and without comparison they cannot be truly judged unless scientific operations and calculations be resorted to.

The busy practician has no time for physics, but he has time for comparison if he cares to provide himself with a standard to compare by. Take the case of negative development. It is usually assumed that the time and temperature tank system is safer and more productive of good results than any other, where quantities are concerned, and it is, when practised with scrupulous attention and on correctly exposed plates. But, alas! as most printers know, the scrupulous attention and the correct exposures are often absent.

I once saw a tank-room which had a set of negatives (let into a window) which could be illuminated at will. They were, in the proprietor's estimation, perfect negatives.

Anyway, they were the kind he paid wages for, and the developing operative was expected to keep up the standard, whether he relied on time and tank or not.

Having those negatives in front of him *permanently* he could never go far off the track; consequently, "bunged-ups" and "shadowgraphs" were't known in that firm.

To come to what I call a "guide print." I found some years ago that the presence of a really good print in the developing room enabled one to work away all day in confidence that when seen in daylight the prints would not show a percentage of "too lights" and "too darks." Since then I have put this to a very decisive test,

Noticing that the output of the developing room—some two to three thousand prints per day—was showing a relatively large number of prints which were not of an ideal depth, I distributed guides among the operatives, with instructions to gauge each print as nearly as possible by the guide. *Immediately all waste on the score of too light or dark ceased.* I thought this was proof enough, but a few weeks later it was strengthened considerably.

The old failing suddenly reappeared as bad as ever, and on investigating the matter I found the guide prints were "non est." As they had become familiar with them, the developing operatives thought it time to "just not bother," hence the prints of mixed depths.

The guides are each composed of two prints, both admittedly good when viewed in full daylight, one representing the most usual, and the other the next most common, styles encountered.

They were placed back to back, covered with two clean glasses, bound lantern-slide fashion, and the binding varnished.

In use they are left lying handy on the bench, preferably in the full light of the yellow lamp. A turn of the eye serves to show if a developing print is *really* as dark as it should be or not.—*B. J.*

Red-chalk Tones

Undoubtedly the "best" way to get red-chalk-tones is to use the carbon process, but this is often impossible, as is also the use of a C.C. printing-out paper. When one has to use a development paper the usual methods are either to tone with uranium or to sulphide-tone and then tone with gold. Both these methods call for chemicals not stocked by many photographers. There is a way in which first-class tones can be obtained direct, or development paper.

Gaslight paper should be used—one of the "soft" brands will suit good studio negatives. The print is very much overexposed and then developed in a highly restrained developer. As a trial give twenty times normal exposure. The various brands of paper require very different amounts of restrainer—this must be found by trial. The print will come up "thick and muddy," but will reduce a lot in the fixing-bath. The image will consist of pure silver, as in a black-and-white print, so that permanence is assured.

This method cannot be advocated for constant use, as the latitude is very small for good results, but under the best conditions really beautiful tones may be obtained. Almost any paper may be used, but personally I have found the most satisfactory results from Noctona.—*B. J.*

Two Fixing-baths

A VERY large number of photographers still work with only one fixing-bath, and I wish to point out to them in this note what a great advantage is to be obtained by the use of two baths for each batch of plates or prints. The great advantage is that it gives a guarantee of complete fixation; but this is not all: it gives cleaner results and, strange though it may sound, it saves chemicals. My own method is, in the case of prints, to give twelve minutes in the first bath and six in the second; after each batch of prints the first bath is discarded, and the original second bath becomes the first. In the case of plates I leave them in the first bath until all the "whiteness" has gone, and the same time, plus five minutes, in the second. When the time in the first bath exceeds ten minutes this is discarded, and the second takes its place. The fixing under these conditions is really complete, and therefore the washing may be cut down, because it is a proved fact that a well-fixed negative needs less washing than a partially fixed one.—*B. J.*

Local Bleaching and Dyeing in Two-color Photography

Two negatives are obtained, one of which is a record of the reds, the other of the greens and blues of the object photographed. From the negative of the reds a positive is printed on blue carbon tissue, and is transferred in water containing 20 per cent. of glycerin, or in water made slightly acid, to a sheet of celluloid, glass or other similar transparent support that preferably has been previously coated with a dammar or other resinous varnish to hold the transferred image firmly during development. As the blue carbon tissue, known commercially as trichrome blue, prints with considerable rapidity and with more contrast than is desirable, this is controlled by the addition to the sensitizing bath of a suitable dye or a non-actinic color. For this purpose naphthol B-green with amaranth is very satisfactory, if used in the proportion of 5 to 10 grains of naphthol B and 5 to 7 grains of amaranth to 24 grains of ammonium bichromate and 1 fluid-ounce of water containing about 20 drops of ammonia to prevent precipitation of the dye. The dye may, of course, with the bichromate be added to the emulsion before spreading upon the paper.

From the negative of the greens and blues a positive is printed on red carbon tissue and transferred to a paper support. Both red and blue positives are now developed in warm water in the usual manner. The red positive is then placed face up in a tray of cold water, after which the blue one may, without injury to the delicate gelatin images, be placed in register upon it (the red image) for examination, when that image which appears too dark may be removed and subjected to further development until the two images are of equal strength or density. In practice it is preferred at this stage of the procedure to develop the blue image somewhat further than the red image, as will be later explained. The blue image is now to be treated with a strong solution of alum for about five minutes and, after washing approximately forty-five seconds in cold water, it is dyed in a yellow dye—preferably in a bath of alizarine yellow in the proportion of 1 or 2 grains of the dye to each ounce of water—the strength of the dye-bath depending upon the tint or hue of green desired, a strong bath giving a yellow-green and a weak bath a bluish-green image. After immersion in the dye bath it is usually advisable to wipe the face of the image very gently with a tuft of absorbent cotton saturated with the dye solution to remove a scum of alizarine lake that forms over the thicker portions of the image which, if allowed to remain, will prevent the dye from penetrating into and sufficiently coloring those parts. When the image is turned to the shade of green desired, which will be in from two to four minutes, the film is removed from the dye-bath, rinsed in the alum solution further to fix the dye and, after washing a short time, the picture may be examined again by superimposing in register the now green image upon the red image in the tray of water, and the latter developed further by immersion in warm water, if further development is needed. This is the reason for not developing the red image too far at the beginning of the operation, for if this were done it would be impossible to obtain a satisfactory picture, because after dyeing and fixing in alum the former blue, but now green, image cannot be further developed.

In order to simplify the process by eliminating the dyeing of the blue image, one may print a red and green instead of a red and blue image, this green image to be obtained by using gelatin carrying a blue and a yellow pigment so proportioned as to yield a bright grass or emerald green. Anilin blue lake or insoluble Prussian blue with alizarine yellow lake or naphthalene yellow lake may be used.

After proceeding as above described the green image on its celluloid support may be held up to the light, or be placed face up on a sheet of white paper, and those parts of the image corresponding to the different shades of blue, lavender, purple, magenta, violet of the object photographed, if any or all of such colors were present in the original scene, brushed over with a weak acid, such as dilute muriatic acid, to decolorize the yellow dye or pigment and leave the blue intact. Now if this so prepared green-and-blue image be superimposed in register upon the red image we shall have, for example, purple in the combined picture where purple should be, for in this area the red image and the blue of the blue-and-green image will be sufficiently equal and intense to produce purple; we shall have blue where blue should be, for here the blue area will be more intense and will overcome the corresponding red area; and we shall have magenta where magneta should be, for in this part the red will be sufficiently in excess of the blue to produce magenta. This particular operation, simple though it is, if performed upon a green image that properly balances in intensity of color and degree of contrast with the red image made to go with it, is capable of producing results that equal those obtained by the more complicated processes of three-color photography in which three separate positives are made from three negatives. But it is necessary for the worker to use judgment and some measure of artistic skill. Those parts of the subject photographed which are blue, or which contain the color blue, are noted at the time of taking the picture by observing the object or scene itself, or as imaged upon the ground glass of the camera, and from the memory of such observation, or preferably from notes made at the time of taking the picture the worker applies the acid where indicated. The strength of the acid is important. An application or two of a solution containing 4 or 5 drops of hydrochloric acid to one ounce of water will produce a greenish-blue; double or triple that strength should be used for lavender, purple and bright blue. Other dyes may be used for dyeing the blue image, for example, naphthol yellow or fast S yellow, alone or combined, but if these dyes are used a weak alkali must be employed to remove the dye, which, however, is a less satisfactory procedure than the method of decolorizing as above described.

The decolorization of the yellow dye may, if preferred, be deferred until the picture is otherwise finished, as will be hereinafter explained.

Inasmuch as there is invariably some expansion, although not always an equal expansion, in the length or the width of the red and green images, during the operations of transferring and development, it is desirable to use some sort of stretching device for the red paper print, in order to secure accurate registration, when mounting the green image upon it. It is satisfactory, having cut the pieces to be printed in the same direction from the roll of tissue, to swell the gelatin of the green tissue fully in the transfer water before transferring to the support, whereas the red tissue is not allowed to swell fully; it is transferred before the tissue is quite limp. In this way we get the green image somewhat longer or wider, as the case may be, than the red image on the paper support, rather than the reverse of this result. The purpose of this is obvious. The red paper print can be stretched to register with a slightly longer or wider green one, but the green image, on its support of glass or celluloid, cannot be stretched to register with a longer or wider paper print.

The blue-green image may also be made by printing in clear gelatin and dyeing the developed print in a dye-blue, such as methylene blue, to be followed by alizarine yellow and the yellow decolorized by a weak acid, where blue is wanted.

Transparencies or lantern slides are preferably made as follows: The red and the blue gelatin papers are sensitized as for paper pictures and transferred while in the sensitizing bath to sheets of celluloid, having a suitably prepared surface to hold the gelatin coating firmly on the paper, which is then allowed to dry. It is well to prepare the surface of the celluloid, through grinding with an abrasive, by treatment with a solvent of the celluloid, such as alcohol, or by varnishing with a solution of caoutchouc or gutta-percha. The same end may be obtained without previous preparation of the celluloid by using an alcoholic sensitizing bath: one containing 25 per cent. of denatured alcohol will answer the purpose. The sensitized film is printed through the celluloid supports and developed as usual. After development the red print is placed face up upon a sheet of glass, and the blue one, after dyeing and fixing in an alum solution, may, for instance, be examined by placing in register over the red on the opposite side of the sheet of glass, and the alizarine decolorized where desired, as already explained. Very attractive pictures to be viewed by reflected light, as paper photographs are viewed, may be made by printing the images sufficiently thin to show properly when bound between a cover-glass and a white cardboard backing. It will be apparent that suitably prepared sheets of celluloid, thin glass, etc., can be coated with the red and blue gelatin emulsions, in which case the use of the emulsion-coated paper, as above, would be obviated. The merits of this particular method are that absolute registration is made possible with but little effort on the part of the operator, and a color photograph produced by simple manipulation, that any amateur in photography can grasp.

The hereinbefore described method may be employed to produce motion pictures in color. by first making the negatives of the reds on a red-sensitive, panchromatic film, and simultaneously the negatives of the green and blues on a green-sensitive orthochromatic film.

From the negatives of the greens and blues are made red positives and from the negatives of the reds are made green positives on gelatin-coated celluloid as already explained. The blues and all colors containing blue, as lavender, purple, magenta, are formed by brushing those parts of the green image where those colors are desired with a weak acid, as already described, and the positives are then superimposed in register and their celluloid sides are united together by passing the two films through a celluloid solvent, such as amyl acetate, followed by pressure, as by passing between rubber rollers. The film is then to be projected in the usual manner.—*B. J.*

Avoiding Troubles

"SOME of the troubles which beset the photographer at the present season are due to a low temperature, although this is not always recognized as the cause. A notable instance may be found in a want of brilliancy and a disagreeable color in bromide prints. The development occupies the normal time or even longer, and yet the results have a rusty look when finished, and in some cases there is an uneven mottled appearance where there should be smooth tints. This is due to the fact that the lowness of the temperature of the developer slows its action to such an extent that underexposure is presumed. The exposure is accordingly increased, and the image appears more readily and seems to be fairly satisfactory until after fixing, when its miserable quality becomes evident. To know the cause is to know the cure, and this may be effected in two ways: One is to maintain the developer at a summer temperature, say 65° F., and the other is to give a normal exposure and allow ample time for development. Some of the makers of bromide paper give two minutes as an average time for development at normal temperatures, but we think that few printers give so long in actual practice. We advise those who are troubled with bad tones just now to give no more than sufficient exposure and go to the full two minutes in the developer if necessary. There is always a tendency to overexpose and cut the development short, and this is the cause of most failures with sulphide toning. A correctly exposed print can be developed 'right out' without fogging or blacking in the shadows, and will tone to a rich brown if desired."—*British Journal of Photography.*

No sounder or better technical advice than this has appeared in the photographic press for many a long day. Never has it been more needed than at the present time.

A cold developer at a temperature of, say, 55° F. is an inefficient and slow developer and a very cold developer in the neighborhood of, say, 50° can scarcely be called a developer at all. No developer, whatever its purpose may be, should every be below 60°—65° is better—and the photographer who realizes this and adopts some means of warming his solution up to this point and keeping it there has his reward in the shape of prints of good color and gradation, always provided that the developing action is carried to its completion and not interrupted half-way.

With a cold developer three things may happen: The image necessarily develops slowly and a batch of prints may be scrapped for underexposure; or, on the other hand, development may be continued and the prints may stain, or if the solution is quite fresh they may be saved, but at the expense of much valuable time. Generally, however, the slowness of development leads to the supposition that it is a case of underexposure, the time is doubled or trebled, so as to bring development within the usual limit, and the result is a batch of granular prints of a rusty greenish-black color, utterly useless for sepia toning, as the article states, but equally useless as black and white photographs.

Quite apart from too low a temperature of the developer, which after all is only a winter trouble, a besetting sin of many photographers is overexposure and interrupted development. In too many instances, where prints are not to be toned, this is done deliberately with a view to economizing time in developing a big batch of prints, but time saved at the expense of the quality of the photograph is time wasted. There is only one way of making perfect bromide prints and that way is to expose correctly and to develop to the utmost—preferably with a developer between 60° and 65°, containing the minimum quantity of potassium bromide required by the paper, usually one or two drops of a 10 per cent. solution per ounce. It is only when the development is complete, or almost complete, that the image in bromide prints reaches its proper black color and its proper gradation, and at any stage short of this the color and gradation are inferior, hence the impossibility of getting good results by overexposure and stopping development half-way. Full development, after all, is not such a great hardship as, with an average enolhydroquinone or dolmi developer at a proper temperature, the average time for bromide paper is from one and a half to two minutes—and prints to be toned require no longer—while for gaslight papers the time is only about forty-five seconds.

The golden rule in the working of any development paper may be profitably committed to memory and it is:

Get the exposure right, watch the clock and the thermometer and the prints will look after themselves.—*Professional Photographer.*

How to Make a Really Good Developing Dish

This dish can be made to take two, four, six, eight or even twelve half-plates if necessary. We have had one in use for years, which will hold six half-plates, and find it a very useful and convenient size for the development of a large batch of plates quickly. There is no fear of them slipping about or injuring each other during development, and very little developer is needed to flow evenly over the lot. The following is what is required for the size to hold six half-plates: Procure from the tinman or ironmonger a sheet of metal known as galvanized sheet of medium thickness. This should be chosen perfectly flat, like a sheet of glass, and such a piece can easily be obtained; it should be squared up on the edge to 20½ inches long by 10½ inches wide. Lay on the sheet six half-plates, placing them in such a position that there is an even space in between each plate. Then make ten marks on the sheet, as in the diagram, and drill holes through the sheet to receive copper rivets about one-eighth of an inch diameter and three-quarters of an inch long. The greasy substance is used to *prevent* sticking. Thus, it is easy to see how important it is to have our surfaces clean and free from grease. But, further, glue holds two pieces of wood together because the wood absorbs the glue, and we have, as it were, myriads of tiny tendrils penetrating each piece of wood and knitting them together. If the glue is too thick the wood cannot absorb it. If the wood is cold it chills the glue to a jelly, and absorption by the pores cannot take place. If the glue itself is too cool the same thing occurs. If the surfaces of the wood are not cleaned, but are covered with old glue, absorption by the pores obviously cannot take place. If the surfaces are not touching all over, it is clear that the parts which do not touch will play no important part in the holding together. I have found from actual experimental tests that the best glued joints have been those the surfaces of which were freshly planed, heated too hot to touch in front of a good gas fire, glued with almost boiling glue, the two pieces being gently pressed or rubbed together for two or three seconds after being brought into contact, and then left absolutely for at least twenty-four hours, and if the weather were damp for forty-eight hours.

Preparing Surfaces

To clean old surfaces is not always easy, but if small, much may be done with a penknife and patient scraping. If the surface is flat, a finishing touch may be put on it by means of glass paper, not too smooth, the sheet of glass paper being laid on a sheet of plate-glass or pinned to a drawing board, and the wood rubbed over it, taking care to keep the piece of wood held quite firmly, so as to produce a dead flat surface. Slightly rougher glass paper is advisable, because a roughened surface holds the glue better; indeed, in some cases it is an advantage to scratch a surface to be glued, using the point of an awl or of a sharp penknife. This is particularly the case with the harder and less porous woods, such as oak, teak, walnut and mahogany.

When gluing end grain, such work, for example, as the corners of picture frames, it will be found that the wood is very porous and the glue appears to have no sticking power. Rather than use the glue thicker, the end grain surfaces should be sized, *i. e.*, given a coating of *very thin glue*, which is left to sink in and to dry. This stops the excessive absorption due to great porosity, and helps materially in making a good glued joint.

When to Glue

I must refer briefly to other work than the gluing of wood, for the sundry odd repairs the photographer will want to do bring cloth, velvet, and leather into consideration. A broad rule is that glue should *not* be used if flexibility is required. A bookbinder, for example, pastes the leather on to the back of the book, because glue would lead to cracking. On the other hand, he *glues* the cloth on the sides because the glue moistens the cloth to a minimum degree. Paste would leave it damp for a long time, and so would spoil the impressed grain or pattern of the cloth. Consequently we should apply tiny patches of leather to the bellows with paste, and if cloth bellows we should still use paste because flexibility is more important there than appearance. Besides which, the cloth used for bellows has nothing in the way of pattern except the woven twill. We should use glue, however, for such work as fastening down edges of leather coming away from the body of a hand camera, or for repairing a lens cap, though both these jobs might be accomplished satisfactorily with Seccotine or some other form of fish-glue. I believe fish-glue, as used by the process worker, if applied hot, and if the metal surface is slightly roughened and heated also, is one of the best adhesives to employ for sticking leather or cloth to metal.

Lastly, I come to the exception to prove the rule. When sticking down velvet strips the glue should be applied to the broad groove in which the velvet will lie, cleanly and evenly, and then allowed to set slightly. The velvet may then be laid down and pressed firmly without any risk of glue coming through the back and into the pile. The glue must not be too thin either, and one or two experiments may be needed to arrive at the proper conditions. It is important to keep the pile free from glue, or the light-excluding property will be impaired.—Adam Cheyne, in *B. J.*

Dark Studios

This is the season when those of us who work in daylight studios have to make the best use we can of what little light is left to us. One of the most frequent causes of excessive darkness in a studio is "dirt." I remember a case in which a studio man made test exposures before and after a thorough "clean-out" of his studio. The meter time, outdoors, was the same in each case, and yet an exposure of six seconds after the clean was found to give the same result as one of ten seconds before! The glass must be well cleaned, not leaving this to the rain, as is so often done. The light blinds must be taken down and washed (it is always best to have two sets so that this may be done). The walls should be cleaned, and if distempered, given another coat. The reflectors and head-screens should also be thoroughly cleaned. All this will not only reduce the exposure needed, but it will give a much better appearance to the studio. Too many studios look absolutely unfit to bring a white dress into, and things like that count with the sitters.—*B. J.*

Vol. 57. No. 8   August 1920   20 Cents

The Photographic Journal

of America

Smithsonian Institution
AUG 4 1920
National Museum

Published Monthly
With Illustrations

Efficiency in the Printing Room

can never be obtained with make-shift or antiquated equipment. A reliable, scientifically correct, modern printing machine is essential in the production of work of highest quality.

The Ansco 11 x 14 Professional Printing Machine is designed for general use. It is easy to install, economical to maintain and uniformly dependable as to light.

PRICES and full description of this Printer and other Ansco professional apparatus for photographic studios will be mailed on request.

ANSCO COMPANY
BINGHAMTON, N. Y.

New York
129-131 West 22nd St.

San Francisco
171-173 Second St.

Chicago
308 N. Michigan Blvd.

Toronto
347 Adelaide St., W.

THE PHOTOGRAPHIC JOURNAL *of* AMERICA

REGISTERED IN THE UNITED STATES PATENT OFFICE

NEW SERIES: WILSON'S PHOTOGRAPHIC MAGAZINE

AN ILLUSTRATED MONTHLY DEVOTED TO THE SCIENCE AND ART OF PHOTOGRAPHY

THE OLDEST PHOTOGRAPHIC MAGAZINE IN AMERICA
Founded 1864

Incorporating:
The Philadelphia Photographer The Photographic World

THOMAS COKE WATKINS, Editor

CONTENTS FOR AUGUST, 1920

Photographic Portraiture . . . . W. C. E. 293
Expression and Light . . . . Antony Guest 299
The Permanence of Color Pigments . . . . Sir William Abney 302
Editor's Table—The National Convention 307
The Studio—Practical Papers on Studio Work and Methods 308
Views and Reviews 315
The Workroom 318

YEARLY SUBSCRIPTION, in advance, postage paid, United States, Mexico, Cuba, Philippines and Porto Rico, $2.00; Canada, $2.35. Countries in the Postal Union, $2.75. Single copies, 20 cents.

REMITTANCES may be made at our risk by money order, check, draft, or registered letter.

SUBSCRIPTIONS begin with current issue.

Published by EDWARD L. WILSON COMPANY, INC.,
THOS. C. WATKINS, President. 701 Arch Street, Philadelphia, Pa.
EXECUTIVE and EDITORIAL OFFICES, CAMERA BUILDING, 122 EAST 25th ST., NEW YORK CITY
HOUGHTON'S, Ltd., London, Eng., Agents for Great Britain
American News Co., Distributors for U. S. Kodak Australasia Ltd., Sydney, Agents for Australia
RICHARD HILL, Devonport, Auckland, Agent for New Zealand

Entered at Philadelphia Post-office as Second-class Matter

This is one of a series of sketches on Leading American Photographers.

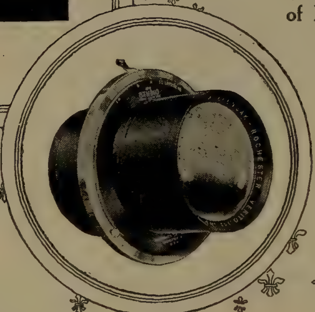
American Photographers

JEROME CHIRCOSTA:—Cleveland, with its many industries, beautiful houses and rapidly growing population, is generally recognized as a "comer".

Choosing this progressive city in which to open his studio, Mr. Chircosta appealed to its modern tastes by producing a class of work distinctly above the average. His training in the art schools of Italy, combined with his knowledge of photography, has helped him in producing portraits that are beautiful from an artistic, as well as a photographic standpoint. Honors, medals and trophies, won abroad and at home, testify to his talent and ability.

Like Jack Garo and Frank Scott Clark, Jerome Chircosta is an artist, painting not only on canvas, but also "painting" negatives with the Verito Diffused Focus F:4 lens.

If you are not already familiar with the Verito, let us send you free descriptive catalog, and tell you why leading American photographers choose this lens for their better work.



That you might better know Mr. Chircosta, we reproduce above just the head of a recent portrait of him made with the Verito by Elias Goldensky of Philadelphia, who is likewise an enthusiastic Verito user.

WOLLENSAK OPTICAL CO.

ROCHESTER, NEW YORK.

$100.00

DEPOSITED IN A NEW YORK BANK, WILL BE PAID THE EXPERT NEGATIVE RETOUCHER THAT CAN RETOUCH A NEGATIVE WITH A STIPPLED EFFECT, EQUAL IN FINENESS, SMOOTHNESS AND REGULARITY AS IS DONE BY THE

ARTOGRAPH
TRADE MARK.

SCREEN Pat. Pending

THE LATEST AND GREATEST LABOR-SAVING DEVICE.

For Professionals. :-: For Amateurs.

NO Time—NO Skill Required.

IF YOU WANT TO SAVE MONEY AND PRODUCE SUPERIOR WORK

SEND FOR ONE TODAY!

Endorsed by Sarony and other high-class photographers.

Sent on receipt of price: 5 x 7, $3.50; 8 x 10, $5.00

The Artograph Screen Co.
500 Fifth Avenue New York City

For Sample Photo send 15¢ in stamps

Sent Complete with Cambination Pink Films that Produce Results

HEYDE'S ACTINO PHOTO-METER

Eliminates Guessing in Photography!!

The simplest, most effective and most accurate instrument for determining correct time for exposure.
Easily and quickly manipulated; compact and always ready for use.

No Sensitive Paper Used For Tinting

Exposure table complete on dial.
Essential to the Photographer who wants perfect pictures.
Order by mail or from your dealer.
Write for descriptive booklet.

New Vest Pocket Model
Size Dia. 2-3/8" x 13/16" Thick
Price $10.

Dealers: A postal will bring our special offer.

HERBERT & HUESGEN CO.
18 East 42nd. Street
NEAR 5TH AVE., NEW YORK.

BY VICTOR GEORG
CHICAGO, ILL.

The
PHOTOGRAPHIC
· JOURNAL ·
· of AMERICA ·

VOLUME LVII AUGUST, 1920 NUMBER 8

THE AUTHORITY FOR THE PROFESSIONAL PHOTOGRAPHER
PJA
FOUNDED 1864

Smithsonian Institution
AUG 4 1920
National Museum

PHOTOGRAPHIC PORTRAITURE

By W. C. E.

I CANNOT recall from actual experience the conditions under which portraiture by the aid of the lens was prosecuted in what appears to us now at times almost remote; the collotype, the daguerreotype, I had no part in. The sitters of those days were doubtless in all essential respects identical with the people who sit to us now, requiring substantially the same attentions at our hands, though not so exacting in their wants and expectations, because the popular taste and education in art advances with the progress of our art itself. What satisfied the general sitter thirty years ago would not find any favor now, just as the long sittings required in early times would not be tolerated now, for the state of the case is well known, and something like an exposure of a few seconds, more or less, is looked for as a matter of course. The word "instantaneous" has come to be associated with all photographic operations.

In portraiture a succession of phases has been passed through, looked at from a professional point of view. One who has stood beside the camera for a number of years can call to mind distinct features belonging to successive periods. These may apply to pose in some instances, and in others to accessories, and so forth. At certain dates we can speak of this or that style being "in fashion." There was, for example, the plain background, then the pillar and curtain, then the picture era, the introduction of the solid accessory, and the time when every one who stood for a portrait was made to lean on the back of a chair. Of course, there were always those who had perceptions of the fitness of things superior to the common tendency of the time, and stood out as the stars of the profession, and no doubt it will always be the same. We live in a time which will take its place in photographic history, and have its characteristics pointed to in turn. It is well, however, if we can rise above our environments so far as to be able to know what is merely temporary and what is enduring in the principles which guide us in our art and practice. For the beautiful is everlasting and can be admired and enjoyed at any time, even long after it may have been discarded for some new form or method of producing an effect.

As the painter must ever be beholden to his brush and other mechanical aids to the expression of his genius, so must the photographer make intelligent use of his appliances in order to the production of his best efforts. As portraits may be painted or produced by other means than those usually employed, so may photographic portraits be produced without a studio; but to the professional man the studio is as necessary in the one case as the other. Amid all changes certain requirements remain, and the studio is one of these. Let me say a word about it: All manner of construction and situation is to be found, and probably advocates for every variety we can think of; but while many are compelled to do with less than they could wish, or a different situation than they could desire, a very general inclination will be found in favor of a north light. My own preference is decidedly toward a north or northeast aspect. My studio is seven feet six inches in height at the side, arising from that at an angle of forty-five degrees. This I consider a good serviceable height. It will be found that a high roof lessens the effective control of light by the operator, without which just so much more difficult and uncertain will it be to obtain the most satisfactory results.

The construction of a studio, apart from its relation to the principal light, has not, I think, very much effect one way or the other on the work produced in it, unless it is of a most awkward and inconvenient description. It must be a very faulty studio indeed in which good work cannot be done, provided there be on the part of the operator the necessary knowledge of the requirements of any particular case, and how to meet them by skilful adjustments, and what I might call artistic tact.

In the matter of lighting the subject, one man's work is apt to partake of a certain uniformity of character, arising from his constantly working under the same, or nearly the same, conditions. A very common error many operators fall into is to set every sitter on the same spot and endeavor to direct the light they judge most suitable on that spot, instead of trying the effect of different points, where they may be placed in relation to the main light—in fact, bringing "the mountain" to Mahomet, instead of Mahomet to the mountain. Where the facilities for doing this are very limited, or where it cannot be done at all, there is no more to be said, and the best must be done with what is available.

Where we have to deal with strong contrasts, such as white hair and high complexion, or white and black draperies, the subject will be most effectively treated by being made to face the light; where the conditions are reversed, an opposite treatment, according to the particular demands of the case, must be resorted to. The matter can only be referred to in general terms. A skillful operator will determine what to do when the subject comes into his hands, and especially when he sees the sitter in the light which falls just about where he is to be taken.

If good lighting necessitates considerable study and knowledge of effects, posing demands no less; indeed, the art of lighting a subject may be mastered with tolerable completeness, while posing may never be thoroughly acquired, because it is less of a mechanical accomplishment. It calls for a knowledge of harmony of lines, and the effect of balancing of parts—what, in short, is described as composition, and which everyone does not naturally possess. An operator may fail in this, just as painters sometimes do, who, though good colorists, are defective as draughtsmen, and in the ability to conceive a good picture. We sometimes feel that photography is too literal to be artistic. From a client's point of view, its tendency is to exaggerate the imperfections rather than the *perfections* of face and figure. Should you have a stout figure to photograph, the neck, as a rule, will appear short. To obviate this appearance in the portrait, it is best to adopt a standing pose, with the camera a little below the level of the head. If a sitting position is chosen, undue height will be given to the shoulders, and the shortness of neck will be emphasized. In treating the opposite extreme—a thin figure with sloping shoulders (not so objectionable in the gentle as in the sterner sex)—I recommend a sitting pose, and in the case of gentlemen, especially when the head is large, a little drapery, in the form of an overcoat loosely thrown back. The head should be turned in the reverse direction from the angle at which the body is placed, which will help to give the appearance of substance and harmony to the figure, and altogether make the picture more pleasing. A little attention of this sort will improve defects in the sitter just as easily as the want of it may produce them where they ought not to exist. As a rule, twist the figure as little as possible when the person is stout.

No doubt many workers have observed that some people turn the head more gracefully in one direction than in another; the head seems balanced in the one case, while in the other it may be the line of the neck and shoulder forms too great an angle. Should it be necessary to take view of the face which gives prominence to this defect, turn the figure away, and the head toward the camera.

Allow me to say a few words as to the treatment of the different features of the face.

When the forehead is high and broad, no particular attention need be paid to the view taken of it; but should it recede too much, and a side or three-quarters view of the face be wanted, let the outline blend with the background. The same treatment should be resorted to where there is an undue fulness of the upper part; of course, in children this is common and is no defect, but when occurring in the adult it should be modified.

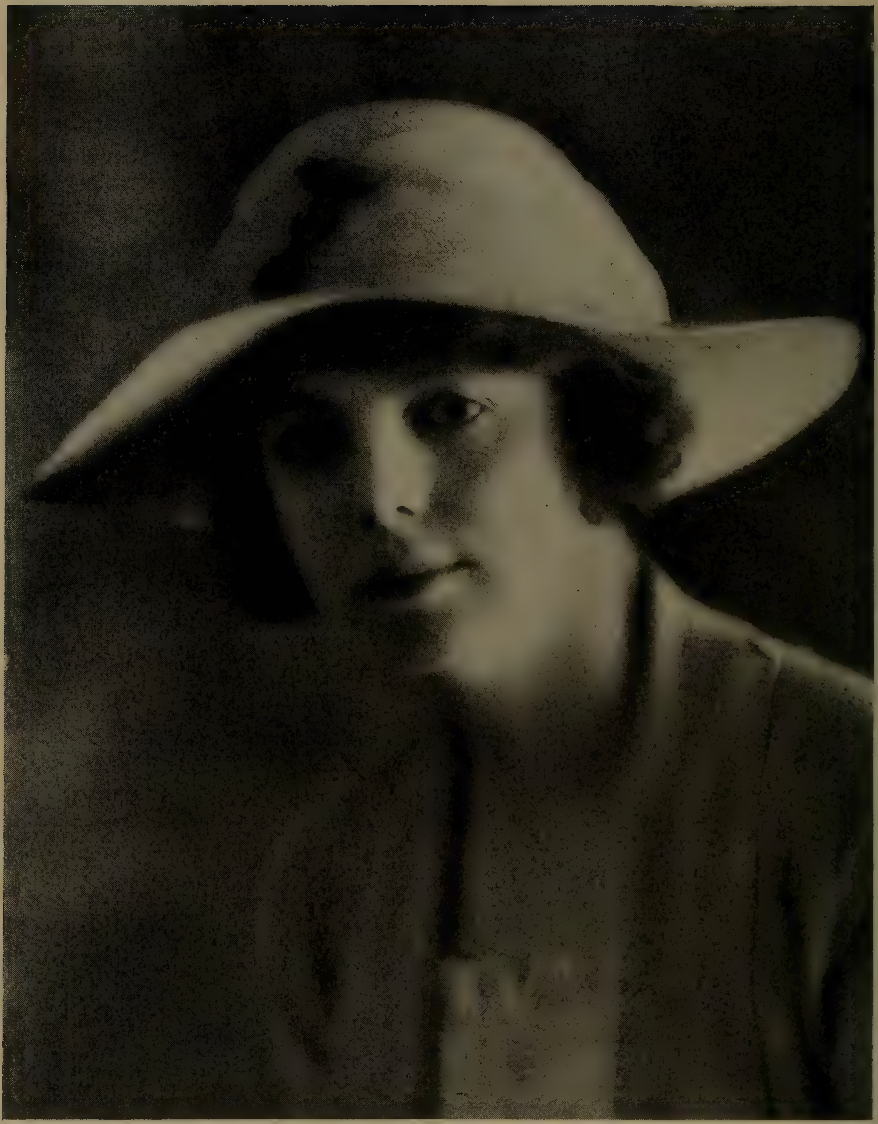
Very often one brow droops a little, or the eyelids may have the same tendency, in which case I find the best plan to avoid exaggerating this inequality, is to turn the figure to that side and the head toward the camera, keeping the droop in the shadow. Variety in noses is endless; make the lens look down at the short and up at the long, or rather place them in these relations to the lens. If the outline be ungraceful, modify it by more front view. A really good or beautiful nose will be valued by its possessor, and its beauty will be best exhibited by a slight turn of the head; a broad nose is improved by the same treatment.

The full eye, when light, is difficult to manage, and if all other conditions are suitable, should be turned away from the light; in fact, the greater portion of the face should be in shadow. When the eye, on the contrary, is dark, avoid reflections which show with marked effect on the eyeball. A sullen eye is generally turned toward the light, but I prefer it turned away, and the light diffused with a medium such as tissue-paper close to the head. As regards the expression of the eye, we must remember that this is an act of the mind and not of the will, and that the old style of request, when being taken, to "Look a little pleasant, please," was wide of the mark, as the endeavor to so do never affected the eye or intellectual part of the expression.

With reference to the mouth, the chief want felt in photographs is lightness and transparency of shadow, caused by the non-actinic color of the lips, as where they are brightest, and therefore most beautiful, the photograph gives the reverse effect. A good deal can be done on the negative to rectify this.

No man will succeed to any great extent as a portraitist who does not exercise a constant and intelligent observation on all that affects his sitters. Details that to a careless or unobservant mind might seem too insignificant to pay any attention to, may yet be of the greatest importance. The things which go to make a pleasing portrait in any one instance may be in themselves little matters enough; the turn of the head, one inch this way or that, the raising or lowering of the eyes ever so little—nothing, in fact, is too small to notice. Let the eye of the operator acquire the habit of taking in his whole sitter. An artist about to paint a portrait considers it necessary to have numerous interviews with his subject, so as to become acquainted with what is natural in the way of pose and expression, in many instances even residing with them for a time, and opportunities are afforded thereby of studying them under various conditions, seeing them in their different costumes, and selecting the one he thinks most suitable. How different is the expression of the faces of people when at their own tables, or in the midst of friends on any social occasion: how vastly different from what we see them when about to take the cap off the lens! An active consciousness enters in and deprives the picture of natural grace and beauty, as well as freedom of expression; the hands very often suffer, losing entirely their natural disposition. When you are thoroughly acquainted with your subject you cannot be deceived by this conscious expression, and you can remind your sitters that they are not looking like themselves. Now, how can this be said or done when ten minutes previously you did not know such a face was in existence? This is the only reason I can give for so many random and missing shots in photographic portraiture. Knowledge of the subject, I say, is more or less a necessity when the highest results are aimed at. But you may say, How is the knowledge to be obtained? Are photographers to spend a week or fortnight at their clients' houses previous to photographing them? Such is impracticable, and certainly in the case of small-sized photos, photographer and sitters in the majority of instances must be strangers; but my remarks point more to larger photos direct from life. I consider it risky—I do not say impossible, because it depends on the subject—to take a large direct picture of a person ushered into your presence and out again in the space of twenty minutes. On a first visit a cabinet might be taken, and on a second visit the large one when you have gained the necessary acquaintance with your sitter's expression. It is a wonderful art, and because it is so, greater wonders are expected to come out of it. The stream of its rapid advance is not confined to one channel, but it continually overflows and tends with eager haste to fields and pastures new.

By NED VAN BUREN
NEW YORK CITY



BY NED VAN BUREN
NEW YORK CITY

EXPRESSION AND LIGHT

By ANTONY GUEST

IN a recent article the above words chanced to come together, and it seemed that their association was happy, for it would be difficult to invent a combination that more completely sums up the qualities which should be the special aim of the artistic photographer. Expression gives vitality to his work; light imparts the appearance of Nature. In considering these two essential characteristics of all good pictorial, as distinguished from decorative, work, it is well to bear in mind the great breadth of their scope. Expression marks small things as well as big, still-life and humanity, the sentiment of Nature, and, what is of no less account, the mood of the artist. The poise of a chair, the spring of a bough from a tree, the dreary solemnity of winter, the brightness of spring, and the personality of a man or woman, all have significance which is to be rendered by a negative no less than by a positive process, namely, the rejection of such matters as do not in themselves aid in conveying the particular idea that it is desired to produce. It is not that details should be ignored merely on the ground that they are not suggestive, for all things have expression; it is because they do not always express themselves helpfully to the main intention. No passengers or stowaways are wanted; all the crew must be working units, and things that do not add vitality to the artist's sentiment or his theme are encumbrances that may be thrown overboard.

In a general way, it may be said that details are the enemy of expression. Among their abundance there are few that help, and for the most part they are so much weight carried to no purpose. But some are significant and valuable, and it is necessary to search for these and to select them with as much discriminating regard for their usefulness as a traveller would apply to the contents of his knapsack. If their weight or bulk is more hindrance to the attainment of the end in view than they can compensate for by their assistance, they must be discarded. For instance, if one desires to enforce the brilliance of sunlight one need not have a pair of sparkling eyes in the foreground; and, conversely, if one is stirred by the radiance of a pair of eyes, and longs to represent them in all their witchery, there is no need to place a stream of sunlight in competition with them. To do so would be to weaken, probably to destroy the effect desired. This, it may be said, is an extreme instance; but in other cases there is only the difference of degree, and the principle applies throughout the whole range of pictorial art. Details either help or hamper the paramount idea; the point is to ascertain exactly what their influence may be before accepting them or throwing them over. Some artists will tell you that they feel this influence without precisely weighing it; but this is a dangerous test for such as have not cultivated their artistic sensitiveness to a very high point.

Details in pictures may be regarded in much the same way as ornament in architecture. Ornament is appropriate when it emphasizes and beautifies the lines of construction; but the structure is the important thing, and if the decoration hides it, or claims attention merely on its own account without reference to its mission, it becomes superfluous, and, therefore, detrimental to the whole.

It is the structure rather than the ornament that tells, and this reminds me to point out that expressiveness must be sought beneath the surface of things. The overlay of detail often masks construction, but should not be so accentuated in the picture as to prevent the construction from being felt. Especially in portraiture is it necessary to make the accidental folds of the clothes subservient to the natural lines of the figure. This is a matter that I am afraid is too often overlooked and the consequence is that many portraits, apart from the faces, are mere representations of clothes, instead of as they should be, renderings of the draped figure. Of course, one need not try to emphasize the figure so completely as the Greeks did with clinging garments, rendered more clinging by being damped. But the figure should be expressed even when in modern attire, and this can be done partly by eliminating misleading lines in the draperies, and partly by cherishing such natural lines as are actually defined. The expression of the figure should accord with the expression of the face.

At the same time it may be suggested that photographers who take up portraiture should give some time and perseverance to the study of the nude, for unless they understand the construction of the figure it is difficult to see how they can give it due expression. No doubt they regard the face as more important; but here, again, it is necessary to look beyond the surface and to note the structure. It is not so much the superficial, and perhaps accidental marks, that give expressiveness to a face as the permanent formation of the bone. But this is a matter that I referred to quite recently, and need not dwell on now. The point is, that expression is found beneath the surface. The structure of a tree must be looked for under its covering of foliage, and the mood of Nature is felt apart from her many bewildering details. To get at the individual one may often have to forego a variety of plausible superfluities. At least the portraitist is on safe ground when he devotes his attention to what is enduring, and refuses to rely absolutely on exterior adornments or defects. If he has a penetrating and sympathetic vision he may reveal an indication of the underlying spirit.

But the artist must also express himself, for in this way he divests his work, whatever it may be, of its mechanical quality and gives its temperament. He need not trouble himself much about this, for he is certain to make his work as characteristic as his hand-writing if he avoids the two pitfalls, imitation and timidity; not copying other workers' styles and having the courage of his own convictions. So he will assert himself unwittingly. It is only when there is a conscious effort at self-expression that it degenerates into affectation. It is scarcely possible to lay too much stress on the importance of the individual outlook of the artist. The expression of Nature is often subjective, depending on the mood of her interpreter. Two men may represent the same scene and their pictures may be absolutely different yet equally true, because they each reflect a particular mood or temperament. One picture may be gay, the other melancholy. One may be a joyous revel in the beauty that exists; the other poetical, mysterious, and restrained. An autumn day may cause one artist to rejoice in the feast of color, and another to repine at the presage of winter. In either case the mood will claim sympathy if it is decidedly expressed; but, as already remarked, if this is to be done, an elimination of such matters as do not help to convey the message and make it clear will be necessary.

Expression is, of course, closely allied with treatment, for the completeness with which an artist succeeds in conveying the spirit of his theme depends much on sympathetic handling. One does not want dainty workmanship in the representation of grim rocks, and such bold, rough handling as would be justified in their case would not be appropriate in a picture of flowers or children. The nature of the subject calls for a corresponding feeling in the technique, so that not only the rocks but the whole picture may convey a rugged impressiveness in one case, and in the other the sense of refinement may be aided by endowing the work throughout with delicate manipulation and tone. Such harmonious relationship between subject and treatment adds to the completeness of the whole and strengthens its effects.

Some think to drive their statement home by the aid of vigorous contrast, and may go to the length of representing a lily with a black background to enforce the whiteness of the flower. But for a picture to excite pleasing emotions and to claim recurrent attention we want harmonies, not contrasts. Contrasts astonish, but only for a moment, and when the surprise has subsided there is no insinuating and lasting appeal such as is found in a quiet design that the eye can rest on. This brings me to the consideration of light as an aid to expression, for if there are violent contrasts of light and shadow their clamor is very likely to drown instead of strengthening the sentiment that the artist wishes to perpetuate. It may be said that the whole idea is to render the effect of a brilliant light opposed to a dark shadow; but, even so, it will be found necessary to modify the contrast, for the light has color and the shadow has mystery, and these qualities, further influenced by atmosphere, are not to be obtained through mere black and white. They demand tone. The lily may be in sunlight and the black fence behind it in shadow, but neither can escape the harmonizing veil of atmosphere and reflected color. Nature's contrasts, though it may sound paradoxical, are all harmonies; in fact, she works for harmony, and those in sympathy with her will aid her effort and not endeavor to force her into unusual contrasts of light and shade.

Light is made expressive, not by contrast, but by being used in the appropriate place. Nature defines light, all things in light, but the artist exercises discriminating selection, for he has to think not only of the virtues of light as a means of definition, but also of its decorative influence on composition and its aid in insisting on the paramount interest of the leading subjects of his theme, and this insistence he will wish to carry out with graceful urbanity rather than by glaring advertisement, remembering, too, that if the highest light is employed on a matter of secondary significance, this immediately assumes an importance that is more than its due.

Natural light is distributed without any such forethought, and it is in supplying the selectiveness and economical treatment omitted by Nature that Art has its mission and the feeling of the artist finds expression; forming a happy partnership between man and Nature, one bringing the brains and the other the capital, each influenced by the other, and both gaining something from the combination.

Not only the high-lights but also the more subtle shades are full of meaning, and it should be remembered that when we speak of light we necessarily include shadow, its inseparable adjunct, for the character of light is explained not by the illumination but by the shadows. In this way are expressed the fundamental conditions of a scene—diffused daylight with no strongly-marked contrasts of light and shade; moonlight, with delicate contrasts; the degree of intensity in sunlight, which is recognized by the comparative strength of its shadows—the full sunlight of midsummer by well-marked shadows, always, however, transparent and modified by the reflection of the sky; the weaker sunlight of winter by slight shadows very refined in quality. The strongest shadows are those produced indoors by artificial light, for there is no sky to reflect light into them and subdue their density. So light will express the season and often the time of day; but it also has a sentimental expressiveness. The sparkle of sunshine gives gaiety to a theme; subdued lights suggest thoughtfulness and repose and low tones may tend to melancholy or may help to promote a feeling of awe. Evidently, therefore, the artist has great possibilities of strengthening his message by the discriminating use of light, and this is a matter that I think deserves the more consideration since I have noticed a growing disposition to produce low-toned pictures without much regard for the particular sentiment that ought to be conveyed. The portrait of a bright young girl or a studious old man, sunny and cloudy landscapes, are often in the same low key, showing that the artist has not thought of the expressiveness that might be gained from light in one case or the other.

There is one other matter that ought not to be overlooked in discussing expression—the great value of simplicity. The plain, direct statement, unhampered by side issues, is that which makes its meaning clear and unmistakable. This with the assistance offered by light, with the piquancy of personal handling and with the adornment that comes of a decorative sense, is what pictorial photographers should aim at in producing expressive and effectively illuminated work.—*Amateur Photographer.*

THE PERMANENCE OF COLOR PIGMENTS[1]

BY SIR WILLIAM ABNEY

SPEAKING generally, every pigment absorbs or abstracts rays of the spectrum which it does not reflect, and it is the collection of the reflected colored rays that gives the color of the pigment. Each particle of a pigment is composed of a very large number of molecules, and these molecules are formed of several atoms, held together by attraction to one another. The rays of light absorbed by the pigment may by their vibratory motion shake away from the molecules one or more of the atoms, decomposing the molecules, and thus change the particles of the pigment. This change in composition is shown as fading. Like the silver salts in photography, if a body is in contact with the pigment, which can take up the atoms of the shaken-off molescules greedily, then the fading in a given time will become more rapid. Such a body is found in the moisture in the air, so that a damp pigment fades more readily than a dry pigment. In the case where the atoms of the pigment, even with moisture present, refuse to be removed from the molecule, there is no fading.

It was owing to observations on the salts of silver, which behaved as just described, that our experiments on pigments were started. There is always moisture in the atmosphere, so that if a pigment is exposed to light under ordinary atmospheric conditions it is liable to fade; if it will fade at all the fading will show itself eventually. In our experiments the light employed was sunlight and skylight. The pigments exposed had various depths of color, No. 1 being the lightest, and No. 8 the darkest. Half of the paper washed with the varying shades of color was covered up with black paper, and the light had free access to the other half. The papers were exposed in glass tubes bent over at one end to form a hook. There was a perpetual change of air in the tubes.

The annexed table shows the pigments which were exposed to light in these tubes, and the results of the exposure. The last thirteen showed no signs of fading. The first thirteen are really unstable, and the whole list is placed approximately in the order of instability. The next thirteen are much less unstable:

Color	Composition according to Winsor and Newton
Carmine	Lake prepared from cochineal.
Crimson lake	Lake prepared from cochineal.
Purple madder	Lake prepared from madder root.
[1] Scarlet lake	Lake prepared from vermilion and crimson lake.
[2] Payne's gray	Indigo crimson lake and carbon black.
Naples yellow	Mixture of zinc white and cadmium yellow.
Olive green	Quercitron lake, bone brown, and ultramarine.
Indigo	Extract from the indigo plant
Brown madder	Lake prepared from madder root.
Gamboge	A preparation from gum resin.
Vandyke brown	Native earth prepared for painting.
Brown pink	Lake made from quercitron bark.
Indian yellow	Prepared "purree" from India.

---

[1] A paper read before the Royal Photographic Society of Great Britain.

[1] Scarlet lake more recently prepared is now made from vermillion and alizurin crimson.

[2] Payne's gray is now made from carbon black ochre and French ultramarine. Both Payne's gray and scarlet lake should now be much more permanent.

Color	Composition according to Winsor and Newton
Cadmium yellow	Sulphide of cadmium.
Leitches blue	Mixture of Prussian blue and cobalt.
Violet carmine	Lake obtained from root of anchusa.
Purple carmine	Lake obtained from root of tinctoria.
Sepia	From the cuttlefish bags.
Aureolin	Double nitrate of cobalt and potassium.
Rose madder	A lake from the madder root.
Permanent blue	A pale variety of French ultramarine.
Antwerp blue	Prussian blue and alumina.
Madder lake	Same as rose madder.
Vermilion	Mercuric sulphide
Emerald green	Aceto-arsenate of copper.
Burnt umber	Calcined raw umber.

Yellow ochre	Native earth.
Indian red	A variety of iron oxide.
Venetian red	Artifically prepared sesquioxide of iron.
Burnt sienna	Calcined raw sienna.
Chrome yellow	Normal chromate of lead.
Lemon yellow	Chromate of barium.
Raw sienna	Native earth.
Terra verte	Native earth.
Chromium oxide	Chromium sesquioxide.
Prussian blue	Ferro-cyanide of iron.
Cobalt	Alumina tinctured with cobalt oxide.
French blue	Artificial ultramarine.
Ultramarine ash	Extract of lapis lazuli.

Looking at the composition of the last thirteen permanent colors we cannot fail to notice that they are all native earths or oxides of metals, with one or two exceptions. In fact, all have a mineral basis, whilst the remainder of the list which have the most tendency to fade are mostly organic derivatives.

It must be recollected that the light used in obtaining these results was of the most intense nature, and not that to which ordinary water-color paintings would be exposed.

The second thirteen colors are probably colors which would not fade in any ordinary light. It must, however, be remarked that when mixtures of colors are employed those colors which are more or less fugitive have a greater tendency to fade than when tested alone. For instance, in a mixture of indigo and Indian red the indigo fades more easily than the indigo does when unmixed. Russell and myself proved this by experimenting with thirty-four mixtures, such as were often used by artists.

The case which I mentioned of the rapid fading of vandyke brown in the light from the sky was probably due to the vandyke brown being used mixed with other colors.

It may be as well to state here we found experimentally that practically every colored pigment exposed to light *in vacuo* declines to fade, and the same may also be said of pigments exposed in perfectly dry air or oxygen, a condition which is non-existent in the atmosphere in which pictures are exposed to light. The presence of moisture is always required to effect a change in color, and we also found that the bluer the light to which colors are exposed the more rapidly, in most cases, will the fading take place.

A reference must here be made to the effect of the light from the sky on pigments exposed for nearly two years in a frame in a window with north light. The following colors were in the frame:

Antwerp blue
Prussian blue
Leitches blue
Indigo
Gamboge
Brown pink
Indian yellow
Naples yellow
Lemon yellow
Vandyke brown
Venetian red
Crimson lake
Vermilion
Rose madder.

Carmine.
Prussian blue and burnt sienna.
Prussian blue and vandyke brown.
Prussian blue and gamboge.
Prussian blue and Indian red.
Indigo and vandyke brown.
Indigo and burnt sienna
Indigo and Indian red.
Rose madder and raw sienna.
Antwerp blue and raw sienna.
Vermilion and chrome yellow.

Our report on the effects of this moderate daylight was as follows:

Of the single colors, gamboge, indigo and Naples yellow had slightly faded; brown pink had faded perceptibly to 6 (the deepest shade but 2); carmine had *bleached* to 3; vandyke brown had faded to 1 and was fainter to 4; and crimson lake had faded to 5; and all the darker shades had become paler. In mixtures, one of Prussian blue and burnt sienna, that had changed, the blue had faded. With Prussian blue and vandyke brown, and with indigo and vandyke brown, the vandyke brown had faded. With Prussian blue and gamboge, the gamboge had slightly gone in No. 1 and all shades had become browner. With indigo and gamboge, all the shades had become pale throughout. With indigo and Indian red the indigo in No. 1 had gone entirely and partly in all tints. The other colors, both single and mixed, had not changed.

This experiment confirms the results which had taken place in strong light. We may, therefore, take it that the list of fugitive and stable colors we have given is the same in feebler light as it was in sunlight. From the permanent thirteen colors we have given, and from the thirteen semi-fugitive colors, we can form a good gamut for the water-color artist.

Various artifices from time to time have been proposed for preventing the fading of pictures in light. A novel and effective one theoretically was to make the frame into a vacuum chamber. But so far as I know there were practical difficulties existing which prevented its general adoption. Recently a glass has been proposed which is said to prevent chemically the active rays from reaching the picture. I have roughly and not exhaustively tried a specimen of this glass, and exposed fugitive pigments beneath it to light this autumn. I have not found that it prevented the fading of the colors I tried, and I should hesitate to adopt it myself. But I hope that others will try its effect. If it is proved efficient it would be a great boon, and the list of fugitive colors might then be of no use. I have said that the blue light (which includes the violet) is that which is most chemically active. I found that if a skylight was glazed with signal-green glass and an orange in right proportions to make a white light by their mixture, the colors of pigments appeared as in ordinary white light and the chemically active rays were cut off. The committee I mentioned in my paper satisfied themselves that such was the case and the Raphael cartoon gallery was so glazed. The public seemed unaware of the peculiar mode of glazing.

May I be allowed to become a little personal for the moment? Having studied the theory of colors from a scientific point of view for more years than I like to remember, when I retired from the Civil Service some eleven years ago I took to painting in water colors as an occupation. Naturally I endeavored to get a gamut of colors which should be sufficient in their range and at the same time as permanent as possible. My color-box now consists of:

Vermilion
Light red
Rose madder
——
Aureolin
Yellow ochre
Raw sienna
Cadmium yellow
Madder yellow
Lemon yellow
——
Emerald green
Viridian
Hooker's green (A new mixture)
Sunny green
Cobalt
French blue
Antwerp blue
Cyanin blue
Violet cobalt.
——
(An imitation and permanent) vandyke brown.
(An imitation and quasi-permanent) brown madder
Turner's brown.
Burnt sienna.
Neutral tint (from my own formula)
Ivory black.

All these colors are either in the list of the thirteen permanent colors, or come near them in the next thirteen. None of the colors is in the first thirteen, which, as already said, I class as fugitive colors.

Before adopting these colors I was anxious to see how the mixtures imitating colors with known names would stand the light. A year or two after the report had been published I determined to try if a short cut could not be found to test the permanency of any color. Some experiments I had made with certain photographically produced colors led me to think that the action of light on pigments in the presence of moisture might be a secondary action, and that the fading might be due to the formation of some oxidizing agent produced by the light on moisture in the presence of oxygen. It had been proved in our report that the exclusion of all air from the color prevented fading, and that colors did not fade when *dry* oxygen was in contact with them, and that only when there was the addition of moisture did the fugitive colors fade. It appeared to me that if oxygen were ozonized in the presence of moisture, the action might be the same as when light was acting with no added ozone present; in other words, that light itself tended to produce an ozonized atmosphere in the presence of moisture, and that it was this which caused the fading.

To test this, strips of the same colors as those which were exposed to the light were moistened and placed in a tube through which ozonized oxygen was passed in a slow current. The oxygen was ozonized by an ozone tube connected with a coil. As I anticipated, there was a fading of those colors which were affected by light. I have already given the list of single colors which were tried, in their order of "light" stability. Practically this same list is here repeated in the following table, but it also shows the times of exposure to the ozone current which were required to cause fading or destruction of those colors which light had been able to alter. The times given as necessary for ozone to act are approximately the relative sensitiveness to fading by the method described.

Pigments in the order of fadings by light	Time of exposure to fade in damp ozonized air.	
	h.	m.
Carmine	0	10
Crimson lake	0	30
Purple madder	0	20
Payne's gray	1	0
Naples yellow	0	45
Olive green	1	5
Indigo	0	40
Brown madder	2	10
Gamboge	0	50
Vandyke brown	1	15
Brown pink	0	30
Iridian yellow	4	0
Cadmium yellow	4	0
Violet carmine	4	0
Aureolin	Unchanged	
Rose madder	4	0
Permanent blue	3	30
Vermilion	Unchanged	
Emerald green	0	45
Yellow ochre	Unchanged	
Indian red	"	
Venetian red	"	
Burnt sienna	"	
Chrome yellow	"	
Raw sienna	"	
Terra verte	"	
Chromium oxide	"	
Cobalt	"	
French blue	3	30
Ultramarine ash	Unchanged	

The same colors were exposed to dry ozonized oxygen, all moisture being excluded. The paper and pigment were carefully dried, and the oxygen had to bubble through a series of bulbs containing strong sulphuric acid, to absorb any moisture which might have been in the oxygen. In no case did the dry ozonized oxygen have any action on the pigments. The most fugitive came out of the exposure-tubes unaltered.

This, be it remembered, was the same when the exposure to light took place in dry oxygen. The pigments remained unchanged.

This experiment proved that unless moisture were present with the ozonized oxygen the test did not work.

It will be noticed that eleven of the first thirteen colors, which in our list showed no change under the influence of light, were taken, and only one of them, French blue, showed any change under the influence of ozonized oxygen and moisture, and that was very small. Of the other twenty-six colors only twenty-three were experimented with, and all of them showed an alteration. Of the second thirteen in the list, seven were tried and all proved to be fairly stable colors; aureolin and vermilion, which under the action of light blackened, showed no deterioration; the others, after an exposure to the ozone, showed slight deterioration after about four hours. Of the thirteen most fugitive colors in the list, scarlet lake was omitted. Brown madder and Indian yellow appeared more stable than they did when exposed to light, the remainder followed very fairly the order of fugitiveness given in the list.

Mixtures faded under the influence of damp ozone more rapidly as a rule than did the fugitive colors by themselves. Where one of the colors was stable the fugitive color completely disappeared, and where both were fugitive —as, for instance, a mixture of indigo and gamboge—both disappeared.

It might be thought that peroxide of hydrogen, which is used for altering the color of hair and for other purposes, might be a substitute for the ozone treatment. So far I have found it quite inoperative in regard to pigments such as have been tested.

Returning for an instant to my own water-color box, I show the results of the ozone treatment. The only case where any fading has taken place in any of the colors is that of rose madder, which had a most prolonged exposure. It will be noticed that where I have replaced a color by a mixture having the same tint (*e. g.*, Hooker's green, made of Prussian blue and aureolin), the color is a stable one, since both the mixing colors are stable. I have brought a few of the really unstable washes to show you, and you can judge of the effect of the ozonized damp air upon them.

With oil paints the ozone test has so far, with me, been unsuccessful. The ozone seems to attack the medium, as the color is so successfully locked up in it that very little effect is produced, even with the most fugitive colors. This is not what takes place when light acts on oil colors, for in a series of experiments (not yet published) made with them the same final results were obtained as with water colors.

A FEW DON'TS

DON'T lose patience in the operating room.

Don't make an exposure of your sitter until everything is right—then go ahead.

Don't expose too short or too long.

Don't stop with one, two, or three trials; don't make them all alike.

Don't say "smile now," "look bright," and wear a frown yourself, or your subject will have it, sure.

Don't pose the eyes straight in line with the direction of the head; turn them a little to the right or left as the subject demands.

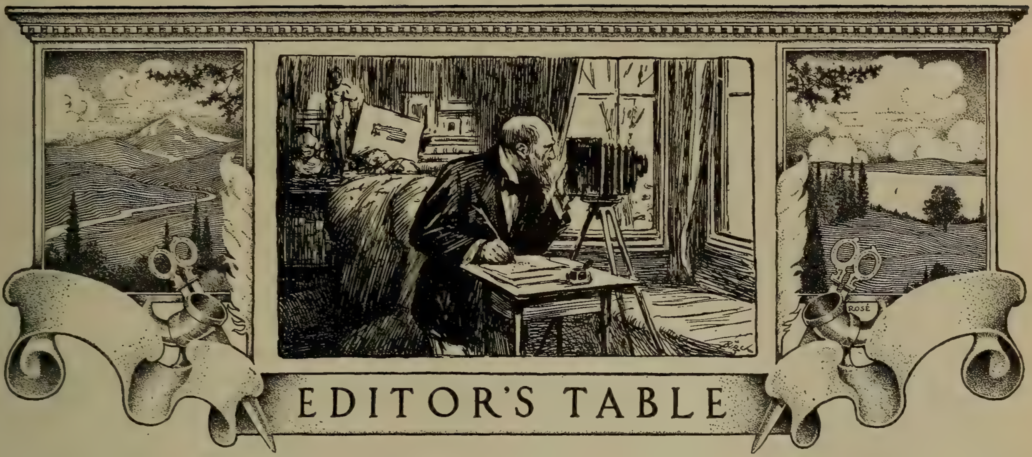
Don't allow anyone in the operating room while making a sitting, unless it is a baby, and then only one person.

Don't allow any one to be a clown for you.

Don't crowd your subject with furniture and backgrounds; it is bad taste.

Don't pose your subjects so as to make them look dreamy and lifeless.

Don't keep your place open on Sunday.



THE NATIONAL CONVENTION

THE time for the National Convention is approaching very rapidly, and we would urge all photographers who have not yet decided to attend to make up their minds at once and arrange to be present.

The city of Milwaukee offers many attractions and has the reputation of being the cleanest and coolest city in the Middle West. The building where the Convention will be held is ideal for the purpose, offering not only a spacious and cool auditorium for the meetings, but an abundance of large, light and cool rooms for the art display and for the use of the dealers and manufacturers.

Artificial light has come to stay; in fact, no one seems to think that daylight is necessary to photographers. Complete demonstrations in the use of the various artificial lights now on the market will be made. There are more inquiries about the use of artificial light than anything else pertaining to photography at this time. It will pay you to go to this convention to see the different artificial lights demonstrated.

Then there is an Interstate Trophy Competition. Better get in on this. $250 will be given to the best display of photographs by any one of the affiliated associations. This exhibit is open to any member, whether active or associate. Here is your chance. Get your pictures there on time so that you can compare them with the work of others. Three judges will be chosen to award the salon honors.

Some of our well-known and successful photographers, men who have the reputation of making good pictures and making money also, have been engaged to give part of their time reviewing for any exhibitor who requests their services. Each reviewer will be assigned to a certain screen and will be on hand at that screen at stated hours. You can talk with him and he will tell you how he thinks you can improve your work.

The Manufacturers' and Dealers' Section this year promises to be a very representative one.

Any amount of new apparatus placed on the market during the past year, apparatus that means a saving of time and the saving of money and the saving of employees, will be on exhibition. In fact, there will be the largest display of photographic apparatus at this convention ever made in the country. Better inspect this display and see how you can improve your studio.

Milwaukee is well supplied with good hotels—the accommodations are ample and the rates reasonable. Photographers who expect to locate at the official headquarters had better make their reservations at an early date.

Make up your mind to attend this big convention and make your plans now. All the indications point to a highly successful convention, and you really cannot afford to miss it. The place is Milwaukee, Wis., and the time August 23 to 28.

PRACTICAL PAPERS ON STUDIO WORK AND METHODS

Keeping Fit

By some means or other—quite how, I do not know—photography has long ago acquired and retained the reputation for being an unhealthy calling, chiefly owing to the use of "all those chemicals and things," as one hears it expressed. Certainly, I grant that work *can* be, so carried on as to lead to impaired health. On the other hand, if reasonable care is used, it will be found quite as healthful as any other indoor occupation.

There certainly are some things, however, which, if attended to, would tend to ensure and preserve decidedly better health among studio staffs. It is not that they are ill exactly, but they are often in that indescribable "below par" condition when minor ills make life and work a weariness, and work has a tendency to drag along and not get done up to time—a state of affairs bad alike for the business and the worker.

To take the biggest sinner first. There is the dark-room—often, indeed, a veritable "dark" room, where for want of a sufficiency of light the worker contracts a perpetual frown, round shoulders and a premature stoop. With modern plates and papers there is really no need for this state of affairs. There ought to be a red or yellow window of at least 18 ins. each way, illuminated from the outside; this is especially important if incandescent gas or oil lights are used, as both of them consume a good deal of air and also give off a good deal of heat and smell, which are much better outside the dark-room than in. It is neither difficult nor expensive to make an opening in a wall or partition if none already exists, and where a worker may have to stay four or five hours at a stretch sometimes, in busy seasons, in the dark-room, the atmosphere becomes positively poisonous, and the result is headache—often the bad sick-headache variety—biliousness, disinclination for food, and at the end of a few weeks a decidedly run-down condition, rendering the worker much more susceptible to metol-poisoning, blood-poisoning and kindred evils.

Then, again, the only time that many dark-rooms are really dry is on Monday morning. Splashes and drippings accumulate, sometimes a dish or sink runs over, and only a half-hearted attempt is made to clean and dry up the floor.

Most dark-rooms are provided with a wooden floor, loose, and made of strips of wood nailed grid-fashion to thicker wood, so that the worker's feet are kept off the floor; but many of these are made so big and heavy that it takes two people to move them. These boards *ought* to be put out to dry each night, but especially where the worker is a female, they are not likely to be, because they are too big to manage single-handed. If they were made in smaller sections it would probably be much better both for the dark-room and the worker, because they would be more easily handled.

Then, also the inside of the dark-room might well be painted white, as bottles, etc., would be much more easily seen against a light background, and if a little care is given to the light there is really no fear of fogging, while the greater amount of reflected light will make it much easier to see what is being done. It should be borne in mind that a red light is always a trying one to work with, and as much as possible should be done to minimize its bad effects. Often a green safe-light could be used instead, and would be much more healthy, preventing many a bad headache.

The question of ventilation is always a vexed one, and often a neglected one also. Much benefit, however, might be derived from a piece of perforated zinc let into the wall high up, or a ventilating brick, preferably to an outside wall. A little piece of wood, forming an inverted Λ, and nailed against it, will cut off stray light, and in this way many a corner might be utilized to form an automatic ventilator, whereby the dark-room worker would much benefit and often lose that pasty, unhealthy look that in itself condemns the owner's working conditions.

Another unhealthy occupation, if long continued, and in the way usually carried out, is dry-mounting. The dry-mounter, for convenience, is often tucked away into some odd corner, and because of the already-fitted gas connections, etc. is never moved. Now, a dry-mounter ought always to be under a window or some other ventilator, and the top of the latter at least should always be kept open while mounting is in progress, as the fumes of the gas and the melting shellac tissue combined are most injurious, and provision ought to be carefully made for the escape of the fumes, especially if the worker is at all weak on the chest. Generally a length of rubber tubing, or a flexible extension which will allow of the moving of the machine, is all that is needed, and certainly costs very little. The saving of headaches, etc., will, however, be considerable, particularly where girls are concerned.

To say that poison bottles, etc., need careful labelling is of course needless; but a friend of mine goes a step further, and in his workrooms hangs a carefully written and framed paper pointing out each substance used of a poisonous nature, and the antidote and treatment briefly stated, in case any accident should occur and any be taken inadvertently. I might say that the owner was himself once nearly killed by an accidental dose of ferricyanide taken one hot day in the dark-room. It is, however, a good idea, as few workers would know the remedies needed if asked off-hand. I know one studio well where it was long the custom to warm up the tank developers in an enamel saucepan, and this after a rinse or two with cold water would be used to heat the milk for the assistant's tea, etc. This is only one instance of the sort of thing that often regularly goes on, and then they sigh because—save the mark—they do not feel "quite fit."

In many workrooms the ordinary shelves are placed much too high for the comfort of ordinary workers, and inasmuch as girls often look after the mount stock, I would like to point out that this reaching, or rather overreaching, entails a very serious danger of causing a serious rupture, often a lifelong complaint once it is contracted. To many of our returned service men, stiff in arms, legs, etc., it is also a danger, and a pair of steps or some other means of shortening the reach ought always to be at hand, for a package of large mounts, say 12 x 10, is no light weight.

Frequently the finishers are inclined to stoop and crouch over their spotting tables, and this again is very unhealthy and bad for the lungs, as well as resulting in more or less perpetual backache. Either the table should be raised, or the seat lowered, until working can be carried on in comfort. The adjustable stools and chairs used by typists in good offices are most convenient. Also, there ought to be some proper place for hanging the outdoor garments of assistants in wet weather, so that they may stand some chance of drying between whiles, and not be so closely huddled up that the damp simply goes on soaking in, with the result that the next time the overcoat, etc., is put on they strike damp and chill. The outcome of this is usually a cold or chill next day, and a day or two's absence from work.

Also, a great many workers complain of headaches and eyestrain. This, of course, should be at once attended to, for the eyes are a precious possession; but often it arises from spotting, etc., with a glare of light on a level with the eyes. The light ought to be reflected downward to where it is wanted, and screened well away from the eyes. A sheet of brown paper or card, with one of white pinned inside, will often serve this purpose in a rough and ready fashion, and the worker will be surprised at the comfort it gives to the eyes. Half-an-hour spent sometimes in fixing up a comfortable light, instead of just jogging along anyhow, will repay itself in comfort and speed hundreds of times over.

One frequent complaint is metol-poisoning and similar skin trouble. Well, this often arises in the first place from lack of care in drying the hands properly. You cannot expect a damp towel to dry your hands thoroughly; also, its touch is at times very painful to sore hands. A far better way is to first dry the hands on a freshly wrung out wash-leather, and then finish them on the usual towel. The leather is a splendid thing to absorb the moisture, and for anyone who suffers from chapped hands or tender skins it is a great comfort. The nails are often the first source of trouble, and these should be kept quite short and carefully scrubbed inside, for irritant poisons will often find a lodgment under the nails—undisturbed, too—when they cannot anywhere else. One has only to watch the care bestowed upon this by any operating surgeon to have this point driven home. Also, after work, if the hands are regularly washed with carbolic soap as used in hospitals, it tends to keep down this pest of metol-poisoning, a very nightmare to some workers. Most excellent antiseptics for any who fear this trouble will be found in lysol and its many preparations, in a solution of which the hands should remain, quite covered, for five or ten minutes, afterward drying carefully on a clean towel. Also clean towels once a week, if you wish to be free from skin troubles, and also *do not* use them for teacloths, to wipe the cups with, as I have seen done.—G. E. H. G., in *B. J.*

Genius and Technic

THERE is a small class of photographers who affect to despise the technical side of their work, fearing that they will not be regarded as real artists if they are acquainted with the composition of their developing solutions or the aperture of their lenses. To these we have nothing to say. There is a much larger class which suffers under the same disability, but not with intent. Their sin, if it can be so called, is simple ignorance. In nearly every other art or science a considerable amount of drudgery is necessary before the novice can blossom out into a practitioner, but in photography the possession of suitable apparatus and premises is, in the opinion of the youthful enthusiast, all that is necessary to bridge the gap between button pressing and professional portraiture. We willingly grant the postulate that taste and artistic knowledge are inherent in the individual, but the question that always remains is: how is a certain impression to be transferred to paper in the most perfect and effective manner? We may compare the untaught photographer with a person who can read music, and appreciate its merits, and straightway attempts to render Bach or Chopin before learning to play scales and five-finger exercises.

Many who have attained a temporary success in photography have done so on the strength of a few lucky flukes, and have found no small difficulty in keeping up their reputation. As their successes have been obtained they knew not how they could not be repeated except by accident, and a level, hardly reaching mediocrity was all that could be attained, aimless experiments with fresh plates and papers only serving to depress rather than to inspire.

To avoid this unhapy state there is nothing for it but to give careful attention to the technical side of photography until it is clearly understood how lenses differ as regards definition, focal length and rapidity; why some plates render colors satisfactorily while others do not; the varying qualities of plates as shown in the vigor or softness of the image; the power of printing papers to reproduce the tonal value of the negative, or to give the precise shades in monochrome which the photographer desires. Such knowledge cannot be evolved from the inner consciousness of the worker; yet without it, unless saturated with self conceit, he must acutely feel his shortcomings, although he does not dare to confess them.

One of the weak points with the untechnical worker is exposure. Fortunately, there is so much latitude that exposures varying between one-half and four times the normal amount will all yield printable negatives, but the farther the correct exposure is departed from the farther also is the result from the effect aimed at when the exposure was made. Even studio exposures can be calculated by simple means with some degree of precision, and guesswork, the terror of the dark-room assistant, avoided.

Although a photographer's education is never completed, no very severe course of study is needed to enable him to work intelligently. For example, the selection and use of lenses call for no knowledge of mathematics or even arithmetic, while the necessary knowledge of chemistry is little more than is required in cookery, so that no one need be deterred from entering upon it. If it can be obtained, personal instruction is the quickest and most pleasant way of learning photographic technic, since the student has the opportunity of clearing up any doubtful points as he goes on, and can explain to his mentor in what direction his aspirations tend. It is to be regretted that the old style of photographic society, where professionals, amateurs, chemists, and opticians met for mutual help, has almost ceased to exist, for much good work was done in this way. The study of standard books, such as those of Watkins, Abney and Chapman Jones, cannot fail to be helpful, but most elementary treatises on photography lack the necessary teaching note which the student requires. Much may be learned by attending trade demonstrations, and such fixtures as the P.P.A. Congress should on no account be missed. We have found among modern photographers little of the old-fashioned jealously and secretiveness which was common a generation ago among non-society-goers, and it is our hope that we may attain the American position where the big men in photography esteem it a privilege to be called upon to demonstrate their methods of working.

We have so far been addressing those who have entered the ranks of photography from the art side at a mature age. In the case of young people who are entering the profession the technical side should be the first care, and a proper course of training, either in a good studio or recognized school, should always be the preliminary step to opening a studio.—*B. J.*

Portraiture with a White Background

The predominating idea in the production of of white-background portraits must be to secure a delicate picture. For this reason, ladies and children are more suitable subjects than men; since they are able to wear light, flimsy garments, and draperies which lend themselves well to the style. Fancy costumes, also, are often very suitable. I do not say that successful results cannot be produced with the darker, heavier draperies; but they are, at any rate, more difficult to secure.

The background itself must be one of the first objects of our attention. It is difficult to secure a pure white. so many of them containing a strong tinge of yellow. The ordinary plate is not sensitive to yellow, so we must avoid such a shade as much as possible. On the other hand, it is very sensitive to blue, and wherever that color appears in a photograph it is easy to secure density in the negative. So the best white background to use is one of a blue-white. As the background has to surround the subject, a continuous background is necessary, that will hang behind and also extend along the floor to some distance in front of the model. The material used is the same as is sold for "plain" backgrounds by photographic dealers.

Some fast plates I find of no use for this work, owing to the fact that if they are at all overexposed it is difficult to get a clean negative with them. On the other hand, if the plate employed is a slow one, harshness often results. A plate of medium speed, say 220-250 H. and D., will be found best.

Exposure is a very important matter. We must remember that we are dealing with a subject containing a great deal of light, and overexposure will result in a weak, dirty negative If this is obtained, it is better to destroy it at once, so as not to be tempted to waste time in trying to obtain a nice delicate print from it. Underexposure is just as bad the other way, and overdevelopment, resulting in a negative that is too hard and thick, will be fatal to success. Instead of giving a delicate print, we shall have a "study in black and white." In short, for this work it is essential to have the negative correctly exposed and correctly developed. In the plates which I use, development is correct when the outline of the image is clearly shown on the back of the plate.

The scheme of lighting to be adopted in white background work will depend upon the fancy of the worker. The great thing is to bear in mind that no strong contrasts must be used. For instance, the style which gives a strong line of light down the side of a face, throwing the remainder into shadow, is not good: although a modification of it, or the same idea simplified, allowing the light to play on one side of the face, but only a little more than on the other, so as to avoid strong contrasts, will give good results.

When quite ordinary round lighting is employed a great improvement in effect is often secured by allowing a little light to play on the light side of the costume, so as to cause it to stand away from the background. Dark furniture should not be used with light costumes, if it can be avoided, as it is very often the cause of too much contrast in the finished print.

Provided the quality of the negative is good, almost any process of printing may be employed, from P. O. P. to bromoil, so it cannot be said that the worker with white backgrounds has a limited selection of papers. Those most generally used are platinum, carbon, and bromide; and in this article it will be assumed that bromide or gaslight paper is being used. The choice of surfaces is a very wide one; smooth matt being as suitable as any.

In making the print, we have to get a soft effect, the picture gradually passing into the white ground: and it is here where new workers are likely to experience the most trouble. It is done by vignetting, which, although apparently a simple matter in the eyes of many, is, to judge from a number of the results I have seen, anything but simple. The fault has been that, although the actual edges of the print may have been more or less soft, the general effect was a mask rather than a vignette. The cause of this defect is that the vignetting cards were fixed too near the negative, and the frame was not moved about enough during the exposure.

The print may be larger than the negative that is used: and for that purpose a larger printing frame will be needed. A piece of glass being put in the frame, a piece of card of the same thickness as the negative has a hole cut in its center the size of the negative, and is laid on the glass. The negative is placed in the opening of the card, which then, in conjunction with the negative, makes a level surface on which the bromide paper can lie evenly. For the actual vignetting, we take a rough proof from the negative and mount it on a piece of thin card. On the print we draw a serrated edge from an inch to an inch and a half away from the figures, and following the outline of the subject, and then cut out along this line with a sharp penknife. If this card were to be fixed down close on the rim of the printing frame, and a print made, it would give the hard vignette to which I have already referred. This can be avoided if, instead of fixing the card down tightly, we allow it to bend upward in a sort of arch. The edge of the opening should have two thicknesses of tissue paper pasted round it, one larger than the other, and the whole may then be covered with a third sheet of tissue paper. This allows the rays of light to spread more over the surface of the paper, and so produces a soft, fading edge to the subject.

In the case of many pictures trouble may be experienced in dealing with the bottom portion of the negative, because, although in a full length portrait the white ground will surround the figure on the negative, and, consequently the vignetting will then be the same all round, in a half or three-quarter length it is different. The figure extends right to the bottom edge of the negative, and, according to the strength of it, it will be more or less difficult to get the required softness. This difficulty is best overcome by putting cotton-wool between the vignette and the negative, pulling out the edge of it to allow of soft printing.

Another way to help toward soft results is to matt varnish the back of the negative, and then to work it up either with stump or pencil, making the edges as solid as possible, and graduating off as the subject is approached. The matt varnish can also be made to serve another very useful purpose. It is often necessary to emphasize a few high-lights or to make one part of a costume print to a lighter tone than another; in such cases a little pencil work carefully applied will do all that is required.

Except once more to emphasize the necessity for moving about the printing frame in such a manner as to allow as varied a direction of light to strike the plate through the vignette as possible, there is no need to say more on the subject of printing.

As a support for pictures of this kind nothing, to my mind, is better than to mount them on a stiff plain mounting board, and then to bevel the edges of print and mount by means of a very sharp knife. Another plan which looks very well is to use a pale gray, limp mounting board, which may or may not have a few pencil lines ruled round the edge of the print to serve as a border. A narrow faint wash of some suitable water-color may be used in place of the lines.

Those who like to put hand work on their prints will find that in this work they have plenty of scope for the exercise of their artistic talent. A sable brush and ordinary water-color (lamp-black), or a black lead pencil, used as if on ordinary drawing paper, will enable some charming effects to be obtained. Hard india rubber, or a sharp knife, enables us to pick out highlights on a print, as either will remove as much of the image as may be required, but a very light touch is necessary to ensure not scraping through the prepared surface.

Sometimes a white costume may yield a print in which the dress in the lightest parts is hardly discernible from the background. In such cases there are several ways of improving the result. One that many will find easy is to use a stump in the ordinary manner. When this work is finished any part of the costume that has accidentally been smeared at the edge can easily be cleaned up with a piece of india rubber.—*Photography.*

Bad Focussing

It is not uncommon in modern portraits to find that those parts of the image which one would expect to find the sharpest not so well defined as other points where sharpness is not essential. For example, we recently saw a bust portrait on which the sharpest definition was on the necktie, the eyes being noticeably unsharp. If this occurred regularly one would suspect either imperfect correction of the lens or want of register between the focussing screen and slide. Occurring occasionally, it can only be due to one of two causes, either carelessness in focussing or a slight movement of the sitter between focussing and exposure. Either of these contingencies can be avoided by exercising a little care. With the present tendency to reduce the exposure to the shortest limit, it is usual to work with very large apertures, and when the lens is of considerable focal length there is very little depth. To ensure absolute definition in the right place, it is advisable to use a proper focussing eyepiece, which also prevents eye strain on the part of the operator. Shifting of the head may be almost always avoided by posing the sitter in a comfortable position so that he is not tempted to relieve any muscular strain.—*B. J.*

Some Timely Resolutions

1. To store all my sensitive material near the floor in a dry, cool place.
2. To get all possible cash discounts for prompt payment.
3. To clear out all old or useless apparatus.
4. To put a little more science or system into my printing department, and to buy a good dark-room clock and thermometer.
5. To always weigh out my chemicals when making up developers, and no more "measure-by-handfuls."
6. To partition off a part of the workroom specially for making up solutions, well away from drying prints.
7. To stick to the maker's formulæ, and make it a personal job to compound all developers.
8. Never to risk my reputation by endeavoring to fix prints in a bath of doubtful efficiency.
9. Always work on the principle of "one dish, one job," and see that I have plenty of dishes.
10. To ask the manufacturers to send a further supply of "dummies," etc., when my window show begins to lose its freshness.
11. In technical difficulties to write to the manufacturers for suggestions or information.—*Rajar Limited.*

The Reflex for Home Portraits

There is perhaps no branch of photographic work in which the reflex camera shows to better advantage than in home portraiture, and it is rather strange that many who use these instruments for outdoor work continue to employ the old-fashioned landscape cameras for this purpose. One very strong point in favor of the reflex is that the most can be made of the distance available between the sitter and the lens, as the reflex does not require any space to be allowed for focussing; in fact, the back may actually touch the wall or any other object which bars the way. It is also very convenient to be able to dispense with a tripod indoors, and to use instead any articles of furniture which may be suitable, although we do not suggest that the tripod be left at home. It will be found that better results will be given by exposing with the mirror if the construction of the camera allows this to be done, since focal-plane shutters are rarely silent when used for "time" exposures. If exposure by the mirror is not possible a small flap shutter can be fitted outside the lens; this will protect the plate while the mirror is being raised, the slide being drawn before or after focussing as circumstances demand.—*B. J.*

The Negative

It comes somewhat as a shock, occasionally, to listen to the confession of a photographer of many years' standing that he does not understand why he does not get satisfactory prints when he is making such fine negatives.

The testimony of almost all of the most experienced printers is unanimous in the positive statement that when a negative is perfect in quality the prints can be made equally as good with the least trouble. In fact we have heard the statement asserted in the broadest general terms, that from perfect negatives the prints just came perfect of their own accord and that no particular skill was required. It is the poor negatives that need the greatest skill and care and experience.

If this is true, and we have seen enough proof of it to believe that it is true enough to establish a rule, then the alternative is that the negative is not as good as the photographer thinks it is. That he is either deceiving himself or is deceived by the negative. The solution of the difficulty, therefore, resolves itself down to the ability to distinguish a good from a poor negative.

Occasionally we are gratified by hearing from the lips of a careful, experienced photographer the statement that every now and then he gets a perfect negative and is just beginning to learn what a perfect negative is.

How can the knowledge or the skill necessary to know a perfect negative when we see it be acquired? If it were easy, every one would learn it early in his career and there would be no need of plate demonstrators or paper demonstrators. But it is not easy and it does require experience and study to gain it. We may know that the quality is poor if the printer has trouble in getting a brilliant, clear picture. If he has to fake here and dodge there and then is compelled to acknowledge there is something peculiar about the result, the place to look is at the negative. But occasionally there comes a negative which prints easily and with all of the detail and brilliance that we so much desire, and right there is the opportunity to become acquainted with quality.

Real quality. Perfect quality. The quality that we wish that we could get in every negative. The quality that makes the printing and the finishing and the delivery a joy and a pleasure.

That negative should be most carefully analyzed as to color, depth of development and balance. The problem becomes merely one of duplicating the factors with regularity and certainty. But it demands no little thought and attention to detail to learn how to get them every time, for it means that precision must be attained in every step from the lighting of the subject to the final washing of the negative. And the result, when compared to our standard of perfection, may show some variation, or it may look like it, and yet may not print up with the same ease and snap. Possibly the eye has not yet become sufficiently trained to see the reason for the difference, and a careful analysis is again necessary to find out the very necessary whys and wherefores.

But instead of depending on judgment and appearance, in reality the easiest method is to adopt the careful and methodical machine-made negative. The happy-go-lucky workman and the professional wise guy can never get anywhere with a mechanical process, for he is either too careless to be exact as to measurements and temperature, or else he knows so much more than other people that he does not have to follow rules and directions.

It does no good to spend time with such workmen, for they can not be taught. They are not confined to any one class of photographers, for they live in the large cities as well as the small towns, and are just as frequent in the lavishly decorated studios as in the plain country gallery. Judgment is fallible and is often merely a high-toned term for guesswork. Even eyesight is variable, and even in these balmy days of national prohibition the eye does not always see straight.

There are rules offered by the plate and paper manufacturers that they are begging the users of their products to follow, but with doubtful success. They have the soundest of reasons for wanting, and of spending real money, to show how to obtain perfect negatives with regularity and certainty, but they find opposed to them a skepticism or suspicion that is very difficult to overcome and that requires the utmost tact and diplomacy to get around. Useful information has to be sugar-coated and garnished with bribes. Sound sense has to be camouflaged with entertainment. Direct and positive instructions have to be tempered with honeyed words and abject apologies. Probably the quickest way to drive a customer to another brand of paper or plates is to prove to him that he does not know a good negative when he sees it, even if it is the everlasting-world-without-end truth.

A negative that is blue in tone may look ever so perfect to the eye and be a thing of beauty in itself, and yet yield a muddy mess that will ruin any photographer's reputation. The same exposure properly developed to a delicate amber will make a reputation and a satisfied customer. When you come to a realization that you do not know what a perfect negative is and do not know how to develop a plate so as to get perfect printing quality, ask the demonstrator when he comes around and listen meekly to what he has to say. Perhaps he has had experience and breadth of information that enables him to know one or two things better than you do. He may not know it all, but it is a hundred to one shot that there are a lot of things you can learn from him for your own profit if you will give him your undivided attention.—*Trade News.*

Photographing Motor Cars and Machinery

Engineers are very exacting people to work for. They are trained to precision, and they expect those who work for them to be as accurate and as painstaking as they are themselves. Unless you appreciate this thoroughly you will be wasting your time in attempting photographic work for engineering firms.

An engineer wants clear, sharp photographs with all the detail plainly shown. He expects you to set aside all your ideas of picture-making. Broad masses of shadow where the detail is suppressed will only irritate him. He wants photographs that will help a prospective customer to visualize a motor car, an engine, or a piece of machinery. A little cam, a spindle or a worm-screw will not seem important to the layman; but it may be a new invention, and in the eyes of the engineer the most important part of the machine. Your photograph must back up his specification.

Motor cars are less difficult to photograph than machinery. They are portable, and it is therefore easy to get them placed in the best light and with the most suitable background. This, of course, refers only to finished cars. When engines or other separate parts have to be photographed, they require the same treatment as machinery.

Before you photograph a motor car, get to know in what respects it differs from other motor cars. Find out its selling points, because you may be pretty certain that the maker will want them shown to the best advantage. You should also ask whether the photographs are to be used for general advertising or for catalogue illustration. If they are wanted for general advertising, you can make them more telling by taking them on an open country road with a good stretch of scenery for a background. If they are wanted for catalogue illustrations, a plain background is best.

This work nearly always needs blocking out. Choose a gray day or work in a shady place. The polished surfaces will give you endless trouble if you attempt to photograph in sunlight. A panchromatic plate and a "K" filter are necessary. Without them your color values will be ridiculous, and the photographs will probably be thrown back on your hands. Above all, use a long-focus lens—the longer the better. If you attempt the work with a wide-angle lens in a confined space, you will get distortion; and, remember, distortion worries an engineer more than it does most people.

Machinery is a tough problem. Small machines or separate parts of large ones are easy enough to deal with; they can be placed on a bench or table in a good light. You will find, however, that most of your photographs will have to be taken when the machines are fitted up in their working positions. Here, as a rule, you have a poor light, a confined space for working, and an object with some parts shining like so many mirrors and other parts painted a deep green, red, gray or black.

Generally you can do a great deal toward reducing the harshness of the light by a liberal use of a cheap material like butter muslin. Light softeners, however, must be used in the right way; otherwise they are worse than useless. Suppose, for instance, that you have to photograph a machine in a room where there is only one small window. Unless you have had experience, you will probably tack muslin over the window and imagine you have done all you can to soften the light. As a matter of fact, you will have done little or nothing toward reducing the contrasts. You will have made it necessary to give a longer exposure, but that is about all. The way to go to work is to use the muslin exactly as you use a head screen in the studio. Hang it up between the machine and the window, as near the machine as you can without letting it show in the photograph. This allows all the light to come into the room, and softens only that which falls directly on the machine. There is as much reflected light as before, and so your shadow detail is not lost.

In addition to softening the light, much can be done to reduce contrasts by toning down the polished surfaces and lighting up the dark parts of the machine itself. You can do this, of course, only when you have the engineer's permission. As a rule, he is only too pleased to help you in any way; indeed, he will often go to the expense of having a machine specially painted when the advantages of this are pointed out to him beforehand.

There are two very good "non-shine" paints, both of which can be removed easily with turps when the photographs have been taken. The first is made by mixing equal parts of fine cement and stone dust with linseed oil to the consistency of ordinary paint. The second, which is easier to apply, should be used when there is much metal to cover. It is made by thinning white lead with turpentine to the consistency of cream and then adding a little lampblack, just enough to dull the white. To five parts of this mixture, one part of gold size should be added to make it stick.

When painting cannot be done, you can reduce the contrasts by dabbing the bright parts with putty. The dark painted parts may also be dabbed with putty and then dusted with powdered chalk.

The floor of a machine room is generally dark and oil-stained. It will help the shadows if you cover the floor with newspapers, under the machine, and round it to a distance of four or five feet. Another useful dodge for picking up the shadow detail is to use a mirror for reflecting light into the dark corners. The mirror can be held in the hand while the exposure is being made, and the light directed to bits of detail which are half hidden in the shadows.

When a machine is lighted from two sides, it is best to block out one of the windows. Cross lights destroy the relief in the rounded parts; they give double high-lights and confuse the detail.

The most trying subject of all is a machine which has to be photographed against the light. The best way out of the difficulty is to block up the window, or wait until night, and then make your exposure by flashlight or magnesium ribbon. There are occasions, however, when the photographs must be taken by daylight, and when you are compelled to make the best of what light there is. In cases of this kind a mirror is very useful for reflecting light back to the dark side of the machine.

The background in a machine room is usually a confused mass of belts, shaftings and other gear. Unless you hang up a white sheet behind your subject, you will find great difficulty in picking out its various parts when you come to block out the negative.

With regard to exposure and development, you will find that the best results are secured by giving a very long exposure—one that would in ordinary work amount to excessive overexposure—and by developing with half, or less, the normal quantity of carbonate of soda in the developer.

Blocking out on the negative must be done very carefully. This is not an easy task where there are many intricate parts to contend with. Opaque is a good substance to use. It is easy to put on and it does not peel off when dry, as so often happens with indian ink. To get clean edges you must go over the outlines with a ruling pen; and be careful not to use the brush until you have done this. For outlining axles, uprights, or any parts with straight lines, use the pen and a straight edge; and for curved parts use an architectural curve instead of the straight edge. Architectural curves may be bought for a few pence at any artists' material shop. After you have gone over all the outlines with the ruling pen, it is then quite easy to work up to the lines with a brush.

It is important to remember at every stage that nothing but the best work will satisfy an engineer. His whole education and professional training have made him accurate and exacting in a high degree; and he expects as much scrupulous care from others. You must be prepared to find these good qualities sometimes carried to an extreme. The writer remembers once submitting a mounted 15 x 12 photograph to a director of one of the largest engineering firms in the country. This man had the instinct for precision so strongly developed that, as soon as he took the photograph in his hands, he said, "*It is not mounted square.*" Sure enough, when the rule was applied, it was found that there was one-sixty-fourth of an inch more plate mark showing on one side than on the other—a fault that would never have been noticed by any ordinary man. Here was a man, however, who had been trained throughout a long life to working to a thousandth part of an inch; and the want of exactness in the mounting worried him so much that he could hardly bring himself to consider the photograph at all.

That was an extreme instance, of course. Speaking broadly, engineers are seldom unreasonable. Indeed, you will generally find them ready to help you in every way possible. Their technical and practical experience makes them more ready than other commercial men to appreciate the dfficulties under which you may be working. If the conditions are so unfavorable as to make it impossible for you to take a satisfactory photograph of a piece of machinery, it is always wise to explain the position frankly to the engineer in charge—and his practical mind will almost invariably hit upon some way out of your difficulty.—*Professional Photographer.*

VIEWS AND REVIEWS

The Southern School of Photography

POST-GRADUATE review for professional photographers by Daddy Lively at the Southern School of Photography, McMinnville, Tennessee, of two weeks, beginning August 30. Photographers who have attended previous reviews, without exception, are enthusiastic over the benefits received. A post-graduate certificate will be presented each professional student.

"New Mexico"

THE author of this book, Dr. George Wharton James, is the well-known explorer, lecturer, and author of *California, Romantic and Beautiful; Arizona, the Wonderland, etc.*

For practically thirty years he has been studying this field. He is fully familiar with it in all its phases and various stages of development. He is a member of a number of the Indian tribes, and on the other hand he is a close student of the elements of the State's highest culture. Every beneficial interest in the State has received full and candid presentation at his hands.

Chapters on: Its Ancient Cliff and Cave-Dwellings and Pueblos; Its Conquest by the Spaniards; Its Franciscan Missions, which surpass in romantic interest those of California; Its Scenic Marvels; Its Antiquarian Fascinations; Its Sedentary and Nomad Indians, with personal accounts of their Ceremonies, Games, Social Life and Industries; Its Historic Inscription Rock; Its Self-whipping Flagellants; Its Geology, Flora, Birds and Hunting; Its National Forests; Its Rivers; Its Gigantic Elephant-Butte Dam and other Land-Reclamation Projects; Its Healthful Climate; Its Rapid Develpment; Its Fine Educational System; together with full and accurate accounts of its most progressive counties, cities, towns and communities.

Large 8vo, handsomely bound in silk cloth, with twelve plates in full color and forty-eight full-page illustrations in duogravure. Boxed, net, $5.00, carriage paid $5.35. Published by The Page Company, 53 Beacon Street, Boston, Massachusetts.

"The Photographic Researches of Hurter and Driffield"

BEING a Reprint of their Published Papers; a History of their Early Work and a Bibliography of the Later Work on the same subject. Edited by W. B. Ferguson, K.C., M.A., F.I.C., F.R.P.S. Quarto. 374+xii pp., 100 Illustrations; Portraits; Index; Buckram binding. Price, $9 postfree.

This volume marks the culmination of the efforts of the Royal Photographic Society to establish a memorial to Hurter and Driffield, and here for the first time all the important papers of these two pioneers in the application of science to photography have been collected together in a convenient form and in chronological order. Consequently the interest of this book is not only scientific but historic, and as these papers are scattered throughout the chemical and photographic literature in a most haphazard way the advantage of having them together in one volume may well be realized. It is noteworthy that although more than twenty years have elapsed since Hurter and Driffield devised their system of sensitometry, and although later work has rendered the validity of many of their assumptions doubtful, their methods are employed substantially unchanged at the present day.

The reprints of these papers are preceded by an article on the early work of the authors, which must have involved the editor in a very laborious study of the original manuscripts, now preserved in the rooms of the Royal Photographic Society, and this introduction not only explains the early ideas of Hurter and Driffield, but also makes the succeeding papers much more easy to follow. In addition to the reprints themselves, the volume also contains the criticisms of the authors' views which were made at the time by Abney and others, and their replies, thus providing a complete account of the growth of the science of sensitometry and such closely allied subjects as photometry and actinometry.

The papers are too numerous to mention in detail, but in particular Hurter and Driffield's paper, first printed in 1890, is now almost a classic, as it placed photography, up to this time carried on largely by rule-of-thumb methods, upon a firm scientific basis and opened the way for its future advancement. Following this reprint is a series of papers on photometers, the theory of photographic reproduction, the latent image, etc.; and the work concludes with an exceedingly valuable bibliography of all the more important papers which have been published upon physical and chemical problems bearing upon photography, which alone would prove invaluable to workers in this field, and which, combined with the complete history of the subject in the body of the work, provides a valuable addition to photographic literature.

Published as a memorial volume by the Royal Photographic Society of Great Britain, this work is perhaps the most notable book on photography published since the appearance of Hunt's classic *Researches on Light* in 1844. Indispensable to students of the photographic process and to all engaged in photographic research.

Address orders to the American Agents, Tennant and Ward, 103 Park Avenue, New York.

The P. A. of A. and the Women's Auxiliary

At the meeting of the Board of Directors of the P. A. of A., at Toledo, Ohio, changes were made in the regulations for the Woman's Auxiliary as follows: No dues are to be collected, each woman who attends the National Convention may become a member of the Auxiliary by signifying her desire to do so, and by the payment for the button which admits her to the Convention Hall.

The disposal of the dues which have already been collected will be decided at the Milwaukee Convention. As a fund for the care of the rest rooms and for the entertainment of ladies attending the Convention will be provided by the P. A. of A. and the manufacturers and dealers, the Board decided that there is no need for the payment of dues into the treasury of the Auxiliary.

Alice W. Chambers,
Secretary.

"Pictorial Composition in Photography"

By Arthur Hammond. Issued through American Photographic Publishing Co., Boston, Mass. Price, $3.50, net.

"To the making of books there is no end." The wise ancient who wrote this was a little too previous or he would have added, probably, the clause, "especially on the subject of composition in pictorial photography." It may be asked, therefore, Why was this book written? One good reason that occurs to us, among others, is that there is such a lamentable amount of ignorance of this subject in America, even among some pictorialists with reputations—however they get them! If the other books that have appeared have failed to redeem them, it may be that the sermon Mr. Hammond's work delivers may reach them, find a lodgement, bring them to repentance and salvation and cover a multitude of sins!

The introductory chapter of thirty-two pages may be found tedious and superfluous by those already familiar with the subject; but the others will rejoice that they are getting the worth of their money, which is so surprising in these degenerate days!

Then we are brought face to face with the discussion and suitably introduced. It will be found, necessarily, that the contents of the volume is a winnowing and an epitome of all that has been previously written. In fact, only the absence of quotation marks, in some passages, has prevented us from thinking we had taken up the wrong book. But the author has infused his subject with so much of his own personality and style, and besides including some new matter, it will be found quite original and commendable. The volume will be found instructive to the novice, and serve to recall to the initiated knowledge of the subject previously acquired but now forgotten or transgressed.

The book is excellently printed and issued, and the publishers are to be congratulated on their achievement and success in the present times and circumstances.

The feature that should most engage and be admired is the illustrations. While there is, here and there, one that leaves much to be desired as an example of the principles enumerated, for the most part they exemplify excellently all the author seeks to teach. They are better far than some of the originals we have seen in exhibitions.

We recommend this book to all who are interested in the subject of which it treats; and we predict and wish for it a large and continued sale.

British Pictorialist at The Camera Club

Bertram Cox, F.R.P.S., of London, England, has sent an exhibit of his pictures which will be on view at The Camera Club, 121 West 68th Street, New York, during the month of September, and possibly before. These will be exhibited free to the public.

Mr. Cox is well known throughout Europe and to many in this country. His process is bromoil and, as an artist, he ranks among the best. We advise our readers not to miss this exhibition.

Portraiture at The Camera Club

The exhibition for July at The Camera Club, New York, consisted of portraiture. It compossed the work of Rabinovitch, No. 25 West Fiftieth Street, New York; and it was well attended and greatly admired.

The portrait of Mrs. McNealey was a remarkable example of camera art, full of character and expression. All the emotions of a lifetime seemed depicted in the kindly features, even the mental experiences could be seen in the expressive eyes. It was truly the rendering of a lovely and loving character.

As a contrast, alike in key and age, was "Mabel Pleahette." It was like a sketch, light and toneful, displaying the charm of youth and beauty most artistically conceived and executed.

"The Spirit of Old Grenada" really embodied the spirit, for the model must have been a child of old Castile. The lines and action of this figure study will set an example worthy, if difficult, of imitation.

Also deserving of high praise, we should mention "Esta Varez," the study of a head, in broad masses, very strong, and well worthy of the unusual type and beauty of the subject.

Other portraits, etc., to be highly commended ware "Lee S.," "Girl in Black," Rose Heller," "B. H. W.," "Emily S.," "Dr. H. T. Kahn," "Joseph Meltzer," "Doris" and "Matilda L."

In the space in the galleries, always reserved for members' work, were some excellent portraits from the skilled hands of that well-known camara artist of the movies, Mr. Ned Van Buren. Among the galaxy of seven stars portrayed were Misses Doris Kenyon, Pauline Frederick, Lorraine Harding, *et al.*, and reference must also be made, as among the best, to "Miss M.," "Miss Helen McDonald," "Mrs. Dill," and "Girlhood," the latter a delicate and beautiful picture of a sweet, young girl.

There will be an exhibition of members' work at The Camera Club, 121 West Sixty-eighth Street, during the month of August.

Dyes for Photographic Plates

At the last meeting of the American Astronomical Society, Miss Florence J. Stocker reported on the progress made by American chemists in producing dyes for use in sensitizing photographic plates to various portions of the spectrum. The dyes used in sensitizing to the green, red and infra-red are of the types known, respectively, as pinaverdol, pinacyanol, and dicyanin. The U. S. Bureau of Chemistry has produced a pinaverdol which is somewhat superior to any German or English green sensitizer, and a pinacyanol which is practically the same as German pinacyanol and English sensitol red. The same bureau has produced several dicyanin dyes which are only slightly inferior to those of German make. Recently the Bureau of Chemistry has submitted to the Bureau of Standards for testing a new type of dye, called kryptocyanin, a sample of which has been found to give a very pronounced narrow region of photosensitivity from 7200A to 7700A. This may prove of great importance for spectrum photography. —*Scientific American.*

New York Photographers to Close Their Studios on Fridays in Future

On the initiative of the Professional Photographer's Club of New York, Inc., at a meeting of members as well as non-members, a resolution was passed to adopt Friday as a "Day of Rest."

To get the general consent of a majority of the city photographers a vote was taken by mail, with the result of a majority voting for the closing of the studios on Friday. Some are in a position to close on Sundays and they prefer that day. This is the first attempt of the Professional Photographers' Club to accustom the photographers of New York to keep their studios closed one day in the week.

E. Chait, Secretary.

"Organic Photographic Developers"

This book contains an exact copy of all the patents issued since 1882, including British, French, German and United States, arranged in chronological order. To these there is added a compilation of abstracts from various academic journals as originally contributed by such distinguished chemists as Anderson, Bayer, Baum, Gatterman, Grandmougin, Hauff, Lumiere, Seyewetz, and many others. There is also added a collection of chapters upon kindred subjects such as Developing, Factorial Development, Bleaching and Intensification, Direct Positives, Toning, Dye Sensitizers, Diazotype Process, Chemical and Physical Characteristics of Developers, List of Developers, etc.

The book was written for the practical photographer and chemical manufacturer and contains many processes and formulas that will bë found useful by them in the conduct of their business.

Of Interest to Women

Why the P. A. of A. wants the Auxiliary, and why the Auxiliary wants You

The woman who is a photographer, or who is engaged in photographic work whether as receptionist, retoucher, or as a manufacturer or dealer in photographic supplies, knows the value of the organization and the pleasure and profit gained by attending the Conventions, and it needs little urging to bring her there year after year. To the woman who knows her husband's work, just as the public does, but heightened by her personal interest in him and his work, there is much to be said. She does not need a technical knowledge of photographic work to help him; she can see and appreciate his work from the viewpoint of the public and can interpret to him just what the public wants; therefore, the conventions will mean as much to her as to her husband. She will review the work of the photographic world and will learn to discriminate between the different classes of work. There will be two minds at work for their mutual advancement. Things he may miss she will see. There is no other profession where the wife can be of as much assistance to her husband without the need of technical knowledge, and there is no other profession in which those who have "arrived" are so ready to help the man who is on the way.

The National Convention wants the photographer, the manufacturer and the dealer. The Auxiliary wants his wife, mother, daughter and sister. Aunts and cousins are also welcome. You all have ideas and can help the Auxiliary. At the same time you will get a broader knowledge of photographic work, and the best holiday and the best return in every way for the money and time it will cost you.

Alice W. Chambers,
Secretary.

The WORKROOM

CONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

Efficiency in the Workroom
Distinctive Warm Tones Direct
Leaves from my Note Book
Sepia Tones
Auramine as a Sensitizer
Green Tones
Grain in Negative Making
Milky Fixing-Baths
Dampness and Faded Prints
Stripping Paper
Photo-Filigraine
Restoring Old Paper
Varieties of Lenses and the Work for which Each is Fitted
Color Sensitizers for Two-color Photography
Methods of Coloring; Print-out Formulas
Repairing Blisters in Enlargements
Two Useful Cements
The Art of Negative Making
Making Enlargements from Film Negatives
Fumes and Dampness
Photographing Materials and Processes
Patent News

THE WORKROOM

By the Head Operator

Efficiency in the Workroom

There are too many photographers today who pay insufficient attention to workroom efficiency. Some kind of system has to be observed in the office and reception-room, but so long as the photographs come through eventually, little thought is given to the methods employed in the workroom.

The processes necessary to the correct evolution of a picture from dark-room to client are many, and our opportunities for increasing the efficiency of working conditions are correspondingly numerous.

In producing photographs—whether in large or small quantities—in "popular price" work, or work of the highest artistic value, system, applied to the methods employed, will be found a wonderful asset to every photographer who strives after success.

No business can derive a maximum benefit without it, and the more this efficiency is incorporated in our workrooms today, the greater will become the capacity of those studios, their output will be larger and better, and an all-round improvement will be the result.

I am not propounding something new. Everyone of us realizes the obvious truth of these facts, yet how many of us apply them to the everyday routine of a modern studio?

I am talking to you today against my own inclinations. I realize that I could learn from so many of you here much more than I am able to teach. But those in authority at this convention have been good enough to consider that our workrooms are conducted on a system which is helpful, and also that we have in those workrooms a few original ideas which ought to be spread broadcast among photographers, hence my appearance here.

I have no doubt that before this convention is over I shall find that my original ideas are also subjected to that old saying, "There's nothing new under the sun." But my efforts are simply directed toward showing what big time-savers and efficiency-makers I have found these ideas to be, and it's immaterial who discovered them.

Before I proceed further, let me suggest that if we spent more conscientious thought on the arrangement and conveniences of the printing-room, 50 per cent. of the photographer's troubles would be automatically removed. I have heard it repeatedly asserted by men who ought to know, that a good printer is as important an asset as any man in the studio; if this be so, then the room he works in should be treated with equal importance.

The old fallacy that a printing-room must necessarily be a dark-room has long since been exploded. Plenty of light is permissible, provided it is safe light, and with light, cleanliness will become an easier accomplishment.

To return to the printing-room. Emphasis ought to be laid on the fact that there is little or no lost motion, that each consecutive process follows the other in direction as well as order. The shelves for storing paper and the cutting bench come first, then the printing machine with negatives in order above it—negatives for enlarging, negatives for contact printing, and all negatives finished and awaiting filing. On the right of the printing machine is the up-to-date enlarging machine, while the lenses used in enlarging are kept in one section of a sectional bookcase, free from dust and danger of breakage. The developing tray follows the printing—stop bath, fixing, and the large washing tanks complete this "circle of motion."

The subject of printing could well occupy a talk all its own and still remain inexhausted, but I am just going to touch one phase of the question which ought not to be lost sight of. I refer to the "doctoring of negatives." What volumes of profanity must have been used to express the thoughts of printers toward the poor operator. Yet it is not always the operator's fault. I make hundreds of the negatives I print, and if those negatives came direct from the dark-room to me, and I was in the habit of using a profane vocabulary, I am afraid I'd often be indulging in the pleasant occupation of cursing myself. Negatives as soon as they are ordered should be returned to the dark-room for careful examination, and a few minutes' work with reducing agent or intensifier, local or general application, will save the printer hours of dodging, and attain a result which no amount of printing can reach. Careful dodging will also give the printing papers a fairer chance. Too many photographers expect the various developing papers to give wonderful results irrespective of the quality of the negative, entirely forgetting the fact that papers can only register what is in the negative.

While on the subject of the printing-room I want to offer a few hints upon little necessary items which are incidental to printing. Let me here explain that these little ideas are not all original, some of them have been handed to me in the hope that they would be helpful, and I pass them along to you in the same spirit with the assurance that I have found all of them very useful.

For cleaning the back of a negative before printing, the sanitary and best way is to put a little pulverized pumice in a piece of coarse-weave flannel cloth. A slight rubbing, without moisture, is sufficient to clean the negative, and, if the neagtive is very dirty, breathing upon it and then rubbing with the pumice pad will be found sufficient.

A good system of lighting a printing machine is to use twelve 60-watt lights for 11 x 14 size opening, instead of four higher power ones. Supposing your negative is not evenly balanced, and the thin section of it lies over light No. 9, break the contact on that light by unscrewing the bulb, and you "even up" your print; or, *vice versa*, if you have a dense section just insert immediately under it a higher watt—say 75 nitrogen—and in most cases it brings the desired result. I have found this system very efficient in saving time with tissuing, etc. The reason for so many lights is to enable the printer to localize the corrections better.

Many studios make a speciality of combination prints, four or five on one sheet of paper. I have found by using portrait films for the negatives that they can be cut down, fastened to one piece of glass, vignetted, and printed under one exposure instead of having to vignette and print each negative separate, which is a tedious process at the best.

In making enlargements one sometimes runs across a negative that is too dense to focus correctly. A simple method to overcome this difficulty (which probably most of you adopt) is to get the approximate focus, then insert a thinner negative, get the final focus, and replace the negative you wish to enlarge, and then expose.

Many a time a printer will pull the black envelope out of the outer covering of a dozen sheets of paper. There may be other black envelopes lying around, and confusion as to what grade of paper they contain will be the result. To avoid this purchase a white pencil and mark the grade on the black envelope as you open it: the pencil mark can easily be detected in the dimmest light.

Before proofing your negatives, number the glass side of them with a negative grease pencil. Then, if two negatives are very similar in position you will have no difficulty in telling which one the customer has chosen when the proofs are returned.

If one has to print an artist proof sheet from a subject that is not in the center of the negative, one can get a little more latitude in width by moistening the finger with a little opaque and running it along the edge of the negative. This will enable one to print to the edge of the negative without getting a black line.

There are various methods of making a diffused print from a sharply focussed negative. I much prefer the result obtained by the following method: Roll your developing paper with the emulsion side in until it stays with a reasonable curve; place in position upon the negative, and hold firmly in contact with the tips of the fingers of one hand. Now start the exposure, and with the other hand gently press paper in contact with the negative, allow it to recoil as soon as it touches, and repeat the operation for about one-half of the exposure; complete the rest of the exposure with the paper in absolute contact with negative. It sounds a bit complicated, but in practice is very simple, and gives a result that is very pleasing.

Absolutely the best method I have found for cleaning discarded negatives is to leave them overnight in used pyro-soda developer. In the morning you will find that a rinse in cold water is all that is necessary to give you the clearest and cleanest glass obtainable.—HERBERT G. STOKES, in *B. J.*

Distinctive Warm Tones Direct

THE work of a successful portrait photographer has invariably some peculiarity or distinguishing characteristic which stamps it as something not just the same as the general run of portraits. As an aid to secure this distinctive note, "warm black" or "engraving" tones have been largely adopted in place of the commoner cold black and sepia. The production of these warm black tones has meant in most cases the use of a slow development paper specially suited to give the required results, and with a few exceptions the warm blacks as produced are confined to a very limited range.

Therefore we may show how the idea of producing warm tones direct might with advantage be simplified and extended. In the first place, while not denying that special papers have individual qualities, we would point out that these tones can be produced on almost any developing paper, though, of course, some are easier to work than others. Most bromides can be used, but (ignoring for the moment specially made papers) the easiest method, and one giving a very wide range of effects, is one using ordinary vigorous gaslight paper. This type of paper, if worked on a certain simple and definite system, will give prints of any color from black, through rich brown to brick red. With good brands of paper the tones obtainable are of excellent quality, and the browns are superior to the usual results of secondary toning.

The system depends on good negatives, excessive exposure, and restrained development. The most important factor is the negative, which must be good. For warm blacks it can be soft or even a trifle flat, but for browns, and particularly for reds, the negative requires to be bold, clean cut and definite; the sort of negative that without being harsh or dense would suggest the use of soft bromide and full exposure for a black print. A strong light-source is wanted if exposures are not to be too prolonged. The warmth of the tone depends on the amount of exposure, or perhaps we should say over-exposure, for all exposures in this system must be generous.

Obviously, a normal developer would be useless with overexposure, therefore the developer must be diluted and restrained. The strength of the solution and the amount of restraining necessarily vary with the character of the negative, the kind of paper and the color required. The following formula is about right for the average case:

Metol	10 grs.
Hydroquinone	30 grs.
Soda sulphite	½ oz.
Soda carbonate	½ oz.
Potass. bromide	12 grs.
Water	20 ozs.

The method of printing differs from the usual. In ordinary black-and-white work one aims at accuracy.

Leaves from my Note Book

In removing silver stains from negatives I have found the preparation made by the following named formula to give very satisfactory results:

Lead nitrate	2 drs.
Hypo	2 ozs.
Sodium phosphate	5 gr.

Dissolve in 6 ounces of soft water and then add 2 drams of alum. Set aside until well settled; use the clear liquid.

I find that this tones the stains away and clears and brightens up the negative considerably. It requires about one hour to remove bad stains of long standing. After the stains have disappeared the negatives are washed and dried in the usual manner.

I have found it easy to revive leather or leather imitation coverings of cameras by the use of the reviver made according to this recipe. This makes about one quart.

Oil of turpentine	½ oz.
Sperm oil	3 ozs.
Acetic acid	3 drs.
Glycerin	3 drs.
Methylated spirit	2½ ozs.
Whites of 3 eggs	

The oils, acid and glycerin are gradually added to the eggs, an egg beater being used to mix them thoroughly. Then the mixture is put into a quart bottle the methylated spirit diluted with its own volume of water is added and enough soft water poured in to nearly fill the bottle. Next 100 grains of aniline dye of the desired color are added and the bottle given a good shaking. In using it is well rubbed into the covering with a piece of flannel cloth.

Here is a very simple method of washing films. When the film is taken from the fixing-bath rinse it well and bend it face inward into the form of a half cylinder and secure it so with a loop of thread. A number of negatives may then be placed side by side like the arches of a bridge on the bottom of the washer. If there is room for them a second row may be placed by the side of the first and if the tank is deep enough another batch may be stood crosswise on the top of the bottom layer. When the water is admitted to the tank it will circulate round and between the negatives, washing them thoroughly.

In making photographs of interiors I focus in the following manner, which produces results superior to those obtained in the usual way: After having determined the nearest and furthest point which the lens will depict in the picture I bring it at full opening to its sharpest focus on a point situated at one-third the distance between the nearby and the far-off rooms and not midway between these two points. The lens is then stopped down until the furthest point shows with the required sharpness and definition at which exact moment the nearest point will also be defined with the same degree of sharpness. When focussing at middle distance it is necessary to use a smaller stop in order to secure the same sharpness for nearby points, thereby unnecessarily increasing the exposure without any corresponding gain in definition.

Recently I made a number of bromide prints some of which had ample exposure but too much development, and I remedied the overdeveloped prints in this way: I made a 10 per cent. solution of iodin in methylated spirit, and also a 10 per cent. solution of potassium cyanide in water. To every ounce of water I added 15 drops of the iodin solution and 30 drops of the cyanide solution. After the prints had been fixed and washed I flowed this mixture over them and removed them from the solution before they were quite as far reduced as I desired and rinsed them thoroughly in water.

The following is a good method of removing the emulsion from negatives. The negative is first washed well in water and then put for five minutes in the following bath:

Commercial formalin	7 drs.
Glycerin	3 drs.
Water	8½ ozs.

After this bath the negative is dried, the edge of the film is cut round and the plate placed in the following soda bath:

Soda	6½ drs.
Water	3½ ozs.

Then without washing the plate is transferred to a solution of hydrochloric acid 4 drams, water 3½ ounces. The film leaves the plate at once and floats on the surface of the water. After a short washing in clear water it may be floated on to a new support.

In photographing waterfalls rapid plates are better than slow ones because, as a rule, waterfalls have dark banks, so that there is extreme contrast and rapid plates minimize this. On the other hand, to obtain sharpness in the falling water and detail in the dark banks, in the first case a short exposure is necessary and in the latter a long one, so that if all is to be obtained on one plate generally a little of both has to be sacrificed. It is best to use two plates, one for the falling water and the other for the banks, and if care is exercised so that the camera is not shifted between the exposures it is very easy to print from the two negatives, masking out the banks in the water negative and the water in the banks negative.

The following is a simple method of transferring photographs to postcards, china, glass for crystoleum painting and similar articles: Having made and developed a print, fix in a hypo bath containing a good proportoin of alum, and wash well in tepid water. The while the print is lying under water at the bottom of the vessel, start to dislodge the film at one of the edges by rubbing inward lightly with the finger-tip. This causes the film to frill and leave the paper. When loosened for about a fourth of an inch along one edge, lay a very thin strip of wood on this so as to catch the edge of the film between both pieces. This done, lift the whole thing out of the water, and, holding both pieces of wood between the finger and thumb of the left hand, catch the stripped edge of the paper with the right thumb and forefinger and pull away gently. The two pieces of wood form a clip and hold the edge of the film, and on the paper being pulled away the film strips completely off. Replace the film in the water and float it on to a piece of strong paper or thin cardboard with the picture side against the side of the card. Remove from the water and allow to drain for a few minutes. In the meantime prepare the surface to receive it, by giving it a very thin coat of starch paste, which leaves no gloss, and on this surface lay the cardboard film down and press well. Remove the cardboard and it will be seen that the film has become attached to the surface. Allow to dry well, and then, to trim up, pass the point of a sharp penknife lightly around the edges to cut just through the film. Slightly moisten the parts of the film outside the trimming mark with a piece of cotton soaked in water and by lifting a corner the strip to be removed comes off quite easily.—William Underwood.

Sepia Tones

It is pointed out that there are two extremes to be avoided—the foxy yellowish brown, bad in color and lacking in strength, and the heavy brown in which all the transparency of the shadows has been blocked up. There are two methods of obtaining these tones—the two-step method of bleaching and then sulphiding, and the single method with hypo-alum or liver of sulphur. In the former it is difficult to gauge the tone, because one has the sudden jump, whereas in the single-bath method the transition of the tones is gradual and easier to control. The solutions are cheaper to compound, take less time in working, and with suitable papers yield a full range from warm black to sepia. It is a well not to use the solution at too high a temperature; although cooler solutions take longer, the tones are more under control. Those who prefer the two-solution method will find that cooler browns are obtained by giving the prints a preliminary soaking in the sulphide solution before bleaching, the usual procedure being followed after bleaching. It is not generally known that bleached prints may be dried and kept for days before sulphiding.—*B. J.*, 1902, p. 210.

Auramine as a Sensitizer

Bloch and Renwick state that auramine when used with the isocyanines considerably increases the red sensitiveness of the plates, gives greater speed and freedom from fog and increases the life of the plates. It can be added to the emulsion or used in conjunction with the isocyanines for bathing, and in the latter case about 2 in 50,000 of solution should be used. English, French and American patents have been issued for this.—*Phot. Journ.*, 1920, p. 145.

Green Tones

A formula was recently given in an American journal for obtaining green tones by sensitizing paper with bichromate and magnesium sulphate, exposing under a negative and then developing with pyrocatechin. If anybody works from this formula they will be disappointed; this is nothing more than a misprint and the process was suggested by Weissermel (*Phot. Mitt.*, 1907, 490). A good paper should be sized with a 2 per cent. solution of gelatin and dried and then sensitized with:

Potassium bichromate . .	30 g
Manganese sulphate . .	50 g
Water	1000 c.c.

This can be freely applied with a broad brush or a swab of absorbent cotton. The paper must be dried in the dark and rather overprinted, till all the details are seen of a brown color on the yellowish ground. After exposure the print should be washed for two or three minutes till the whites are clean and then surface moisture blotted off and the surface swabbed with a 10 per cent. solution of pyrocatechin, when a fairly bright green color is obtained, washing for about five minutes and drying rapidly in front of a fire will complete the job.

Grain in Negative Making

A certain amount of grain will always show whatever developer is used for developing a wet or dry plate. The slower the development the finer the grain. An experimenter wishing for the finest grain with wet collodion, might try the following formulæ for development:

Water	40 ozs.
Acetic acid (glacial) . .	2 ozs.
Ferrous sulphate (pure) . .	1¾ ozs.
Alcohol	1 oz.

or

Water	40 ozs.
Acetic acid (glacial) . .	180 min.
Lump sugar	¼ oz.
Ferrous sulphate (pure) . .	½ oz.
Alcohol	1 oz.

Fix in 5 per cent. potassium cyanide of 33 per cent. strength.

Intensification can be carried out by re-development. Take the above developer and add a small quantity of 10 per cent. silver nitrate solution and flow over, or

Water	10 ozs.
Citric acid	40 grs.
Pyrogallic acid	20 grs.

Before use add a small quantity of 10 per cent. silver solution.

The German method of producing almost grainless results is evidently a modification of the albumen or collodio-albumen process. The process gives almost a grainless result, is very slow and very delicate. An outline of the process is as follows: The whites of several eggs are well beaten to a froth and after standing for twelve hours are filtered, an addition is then made of bromide and iodide of potassium and again filtered. The glass to be coated is placed on a level stand and then coated with this mixture and dried. Sensitizing is carried out in a silver bath. After sensitizing the plates are well washed in distilled water to remove free silver nitrate, and can then be dried by heat and are ready for exposure.

Formula for albumen-iodized solution:

Potassium iodide	15 grs.
Potassium bromide	4 grs.
Iodine flakes	4 grs.

Sensitizing bath:

Distilled water	10 ozs.
Nitrate of silver	1 oz.
Glacial acetic acid	3 drs.

Developer: Saturated solution of gallic acid to which has been added a few drops of 5 per cent. solution of silver nitrate. When developer gets cloudy take fresh developer; development is very slow. Fix in 10 per cent. hypo solution. —*B. J.*

Milky Fixing-Baths

Photographers sometimes have trouble, especially during the warm summer months, with their acid fixing-baths. Their baths become milky, and, as a result, they get brown or yellow spots, and sometimes a brown tone over the whole surface of their prints. The trouble can be avoided by taking a few precautions.

Prints must be hardened in the fixing-bath, and alum is the best hardener. Alum in combination with hypo will release sulphur; but acetic acid and pure sulphite of soda form a gas which prevents the releasing of sulphur and forms a perfectly balanced fixing-bath. If, however, the sulphite contains sulphate, sulphur will be released and the bath will become milky. The same is true of sulphite which has deteriorated through exposure to the air.

When you are sure that your sulphite contains no sulphate, there is still another precaution to take in mixing your acid fixing-bath. Be sure the hypo is thoroughly dissolved before you add the hardener. If any hypo remains undissolved, the addition of the hardener will release sulphur and make the bath milky.

A properly made fixing-bath should never be allowed to get very warm. Even with an unused bath, if it is made very warm, the gas formed by the acetic acid and sulphite of soda will partly escape and allow the sulphur to be released. The simplest and safest way to make up the bath is to have a stock solution of hardener, then, when the hypo is dissolved in the proper quantity of water, it is an easy matter to add the required amount of hardener.

Prints fixed in a milky acid fixing-bath really begin to take on a sulphur tone while fixing. This may not be noticed when the prints are taken from the bath, or while in the washing water, but all the same, the toning process has begun and will continue even after the prints have been laid out to dry, especially if the room is warm. The result is prints with brown or yellow spots, and sometimes a brown tone fairly even over the whole surface.

Use E. K. Co. Tested Soda of certain purity, and be careful not to expose it to the air. Keep a stock solution of hardener and mix fresh fixing-baths as needed. Do not add the hardener to the hypo until the hypo is thoroughly dissolved, and do not allow it to become warm after it has been mixed. These are all important.

Of course, you all know that a fixing-bath should not be overworked. Prints will neither be properly fixed nor well hardened in a bath that has most of the active chemicals worked out of it.—*Photo Digest.*

Dampness and Faded Prints

That there are so many different views held as to the relative permanency of photographic prints is probably due not only to variation in the methods by which the prints have been made, but to the conditions under which they have been kept. When both sets of conditions are favorable a fairly high degree of permanence may be obtained even with silver images, while on the other hand a few weeks or months at most may witness the almost complete destruction of the image.

Leaving out of the question chemical vapors such as might be found in a laboratory—iodine, chlorine, or sulphurous acid—it would seem that there are two main features in the destruction of an ordinary photograph: the sulphurous vapors usually present in town atmospheres, and dampness.

We have lately had an interesting demonstration of the action of damp by the discovery of a large number of photographs, embracing examples of nearly all the processes in common use, which had been stored in a cupboard presumed to be dry, but which by the unsuspected leakage of a pipe embedded in the wall was extremely damp at one side. The photographs were of all ages: some albumen prints made over thirty years ago; bromides of all ages from thirty years to three months; some P. O. P. and collodion prints of all dates, as well as a few carbon and platinum prints and some three-color process proofs—all were in this collection. It may be as well to say that, in spite of their age, all the prints were in fairly good condition when stowed away a little more than a year ago. The deterioration, which has in most cases been utterly destructive, is clearly due to the damp atmosphere. The albumenized prints have faded from a good purple to a yellowish brown, the paper also yellowing. The bromides, originally brilliant specimens, have in the case of untoned prints faded almost away, while sulphide-toned ones have lost much of their strength. Prints on collodion papers have faded badly, showing a spottiness not present in the bromides. Only platinum prints were absolutely unchanged. In some cases mildew has formed upon the surface, but when this was removed the image, as was to be expected, was perfectly good. Carbon prints have stood well, except that where mildew has appeared the surface of the gelatin has been spoiled. A curious effect was observable in the prints from three-color blocks; in some cases the red printing color had, through the action of the damp, diffused itself all over the surface of the picture, and in some cases through to the back of the paper.

As a contrast to this we have prints made under similar conditions which have been kept in dry cupboards, in a gas-lighted, stove-heated room, which have endured wonderfully well.

It is thus seen, then, that damp is a most potent factor in the fading of prints, and every precaution should be taken to protect silver images from it. In the case of framed pictures it is of little use to paste up the backs of the frames as long as the cardboard and wooden back remain porous and permeable to the atmosphere. It would seem that the safest treatment, as far as permanency is concerned, is to dry-mount the prints with a good shellac tissue, and to coat the faces either with a varnish or to rub them with a good encaustic paste.

It must not be overlooked that although toned bromide prints have suffered from their severe ordeal they have not done so to the same extent as the black-and-white ones. In the case of the albumen prints, those toned to a purple have been found to fade less than those of a brown color.

No oil-prints or bromoils were submitted to this involuntary test, but it is to be presumed that they would have stood it as well as a few collotypes which had retained their original freshness. The moral which the professional photographer may draw from this experience is that it is very desirable to keep all showcases and window enclosures well ventilated in damp weather, and that in the case of pictures hanging upon outside walls a couple of corks or studs should be placed at the lower corners of the frame, so as to allow of a current of air passing between the wall and the picture.—*B. J.*

Stripping Paper

M. Tranchant states that all bromide, gaslight and collodion papers may be stripped by the following process: Development should be carried at least twice as far as usual if the results are to be used as transparencies. After thorough washing the print should be immersed for ten minutes in a 10 per cent. solution of formalin, then rinsed five or six times in water and immersed for ten minutes in a 50 per cent. solution of carbonate of soda and drained and the surface moisture removed with blotting paper or a swab of cotton. The print should then be squeegeed down to the glass and left for about an hour in winter, or half an hour in summer, and then immersed for ten minutes in a 10 per cent. solution of hydrochloric acid. Immediately innumerable bubbles begin to make their appearance and in a few minutes the paper can be readily stripped, leaving the image on the glass. If the glass is previously waxed, the image may be subsequently stripped and the film kept between the leaves of a book. The author states that he has used this process with success for making enlarged negatives.—*Phot. Rev.*, 1920, p. 66.

Photo-Filigraine

Namias suggests the following method for obtaining water-marks on paper and states that it has been applied commercially. Soak a sheet of stout paper in water till thoroughly wet, then blot off with blotting-paper and squeegee to a sheet of glass, or rub it into contact with the hand. Then coat with the following solution:

Gelatin	150 g
Glycerin	50 g
Neutral citrate of soda	5 g
Water	1000 c.c.

Make this quite hot and allow 25 c.c. to every square decimeter. The glass bearing the paper should be levelled and the solution poured on and allowed to set well and dry with the paper on the glass. When dry the paper should be immersed in a 3 per cent. solution of potassium bichromate and dried in the dark and printed under a vigorous negative, preferably a line subject, such as a diagram. The exposure should be to the sun or an arc lamp, and it should then be treated with water at 105° to 110° F., till nothing but the design is seen to be left on the paper, then the sheet may be hardened in a chrome alum bath and fixed and the paper fastened by the edges to a sheet of glass or cardboard and dried. From this relief a wax or plaster mould can be cast, or a rubber mould made.—*Photo Rev.*, 1920, p. 70.

Restoring Old Paper

M. Strauss finds that old bromide paper may be rendered as good as new by immersing in a bath of

Potassium bromide	30 g
Sulphuric acid	10 g
Copper sulphate	10 g
Water	1000 c.c.

or

Potassium bichromate	40 g
Hydrochloric acid	20 c.c.
Salt	10 g
Water	1000 c.c.

Then wash well and immerse in a 5 per cent. solution of resorcin and dry without washing.—*Bull Belg.*, 1920, p. 86.

Varieties of Lenses and the Work for which Each is Fitted

It is possible that the reader may have come to the conclusion that one lens is as good as another for most purposes; but he is not likely to have misunderstood their use to that extent. He will probably realize that one lens is not better than another because the photographs obtained with it necessarily give finer definition, but that the good lens shows its superiority by giving sharp pictures under less favorable conditions.

The simplest lenses used by themselves in practical photography are to be found in fixed-focus daylight enlargers. These are usually nothing more than plain spectacle lenses or magnifying glasses, composed of a single piece of glass. As daylight is plentiful, a very small stop can be fitted to them, and so even as simple a lens as one of these can be made to give a sharp image. If the photographer examine one, he may find that it has a focus of four inches or less, while the diameter of the opening in the stop fitted to it may be less than one thirty-second of an inch; so that the lens is working with a smaller stop than f/128.

Single Lenses

The cheapest hand cameras are provided with what is called a "single" lens, but is actually one composed of two glasses cemented together with Canada balsam. Properly constructed, such lenses will give very fair definition with f/14 or f/16 when they include an angle of about 60 degrees, which is approximately that at which they are used. If such a lens is used at a decidedly smaller angle, the working aperture can be enlarged to f/11 or f/8, or, if the stop is kept the same, the character of the definition toward the corners of the plate will be better.

The cheap single lens just described is sometimes called an "achromatic meniscus." There are more elaborate "single" lenses composed of three or even four glasses cemented together. They are true anastigmats, and can be used at an angle of 60 degrees, or thereabouts, at f/11, and will give critically fine definition over the whole plate. They are not to be found ready fitted to cameras, however, as they are costly, and, in single form, are comparatively slow. Some of the finest anastigmats consist of two such lenses used together. They then work at f/6 or so, and will be mentioned later.

The Rapid Rectilinear

The reason why hand cameras are not supplied with such single anastigmats is that a large aperture is very important for hand camera work; and if something a little better than an "achromatic meniscus" can be provided, a "rapid rectilinear" will give a greater increase in rapidity than the single anastigmat, though without the very fine definition of the latter. Nearly all rapid rectilinears, or "R.R.'s," as they are written, work at f/8. With such an aperture, over an angle of 60 degrees, they give distinctly better definition than the "achromatic meniscus." In very small sizes, and for special purposes, they have been fitted with f/6 or larger apertures, but at the expense of the definition toward the margins of the picture.

The Anastigmats

When a more rapid lens than one at f/8 is required, we come into the class of anastigmats. Some of these only work at f/7.7 (which is practically f/8) or at f/8; but at this aperture they should give distinctly better definition toward the corners than an R.R. at the same aperture and including the same angle. Anastigmats of various patterns are made to work at f/7, f/6.8, f/6.5, f/6, f/5.6, f/4.5, and some at f/4, and even at f/3.

Any of these, critically examined, should give at its full aperture and over the same angle as fine definition as the f/8 anastigmat gives at f/8, and very distinctly finer definition than the R.R. with similar conditions. But there are degrees of fineness, even among anastigmats.

Convertible Lenses

Some anastigmats and all rapid rectilinears are "convertible." That is to say, part of the lens may be removed, and the part which is left used by itself. The part will have a decidedly longer focus than the whole lens. It is customary to assume that the focus is doubled, but this is only a rough approximation; and if the difference is not known, it should be found by trial.

As the size of the stops remains the same while the focus is increased by removing part of the lens, the f/ numbers of the stops are altered proportionately to that increase. Unless the camera has "double extension" or more there is no advantage in a convertible lens, as the "single combination," as it is called, cannot be used without the extra extension.

Claims are sometimes made for lenses that their single combinations can be used alone, which claims, while justified in the letter, are actually misleading. It must not be forgotten that while any positive lens, that is to say, any lens which will act as a magnifying glass, *can* be used to take a photograph, it is of little use the photographer having such a lens unless it can be used with a fairly large stop. A dealer, therefore, is hardly justified in saying that a lens is "convertible," or that its single components can be used separately, unless this can be done without having to use a much smaller stop than that in the complete lens.

Thus if the complete lens works at f/6.5, its single component ought to give an image practically equal in definition with that same stop. The f/ number of the stop, it should not be forgotten, is no longer f/6.5, although the size of the opening has not been altered. If the half lens has twice the focus of the complete lens, f/6.5 will become f/13, and so on in proportion.

"Portrait" Lenses

Omitting telephoto lenses, which hardly come within the scope of the beginner, these are the principal types likely to be met with. There are also "portrait lenses," which, until anastigmats of large aperture were made, were the only very rapid lenses available, and therefore were those generally used for portraiture. They work at f/3.5 to f/4.5, and are very useful for their own particular purpose; but they, too, are a little beyond the beginner.

A few words may be added on the purposes to which the different types may be put. Practically all the lenses named are available for all purposes, when conditions permit; it is hardly anything but a matter of rapidity.

For hand camera work, for example, f/16 is decidedly slow, so that the possessor of a hand camera fitted with such a lens is limited, as far as snapshots are concerned, to open subjects in a good light, and to those which are not in such rapid motion as to need a very fast shutter. If his lens works at f/8 his powers are proportionately extended; he can give exposures one-fourth as long in the same light, or exposures of the same length in light one-fourth as powerful, and get equally well exposed results. With anastigmats at f/7 or f/6 the scope is still wider.

A Limitation of Aperture

It must not be forgotten, however, that the larger the stop the less capable is the lens of giving near and distant objects sharp at the same time, and the more necessary is it to focus accurately. Many a worker who has got sharp pictures with a cheap camera and f/16 lens has invested in an anastigmat, working, say, at f/6.5, only to find that his pictures are no longer so sharp. Either he is not focussing carefully, or he is attempting subjects which demand more depth of focus than his anastigmat at the large aperture will give. Were he to stop it down to f/16 he would find that it would give him finer definition than his old lens, and was just as easily worked. A high-class lens is an instrument of precision, and to take advantage of its qualities, one must learn to use it as such.

For landscape work, or for any form of photography in which the camera can be put on a stand and a time exposure given, there is not so much to be gained by the use of a high-class lens. For architecture, for instance, it is not very important whether we have to give five seconds or five minutes, so little is gained by using a lens at f/6 instead of one at f/16 or f/22.

Distortion with Single Lenses

One characteristic of the single lens, however, must be mentioned in that connection. Such a lens, whether merely an achromatic meniscus or a single anastigmat, is not what is called "rectilinear." (It must not be forgotten that many lenses besides so-called "rectilinears" are actually rectilinear.) That is to say, single lenses give a more or less distorted image. The degree of distortion is often altogether over-rated. One may use such lenses on subjects likely to show it, and never notice it at all, unless it is deliberately looked for; while the vast majority of subjects which the amateur photographer attempts would in no case reveal it.

This distortion is such that when a straight line in the subject is photographed so that it falls near one of the edges of the picture, and more or less parallel with that edge, the line in the photograph is not straight, but is more or less curved. It is only likely to be noticeable at all in certain architectural subjects, and in certain forms of copying.

The narrower the angle included by the lens, the less likely is it to be in evidence. So that while it may be noticed when a camera fitted with a single lens is used, it is not likely to show if we are using half a convertible lens: as such an instrument, used on a plate of the same size as the whole lens is used on, would be including a comparatively narrow angle.

Lenses for Portraits

A lens for portraits should be rapid, so as to allow exposures to be kept short. It is also advantageous to have it include a narrow angle only. If the lens ordinarily fitted to a camera, which, as has been pointed out, usually includes an angle of about 60 degress, is used for portraits, there is likely to be trouble with what are called "wide-angle effects." These are often very noticeable. A sitter's hand, for example, if it is decidedly nearer to the camera than his head, will appear magnified out of all proportion. A shoulder or arm turned toward the camera is similarly distorted. The immediate remedy for such defects is to move the camera further away, which gives the sitter on a smaller scale. With such a camera and lens, therefore, it will be best not to use the whole of the plate for a portrait, but to be content with cutting a small picture out of the middle of it, or enlarging. When getting a lens for portrait work only, it is wise to get one of at least double the focus which would ordinarily be used on the same size of plate for landscape, architecture, and general work.—*Amateur Photographer.*

Color Sensitizers for Two-color Photography

English Patent No. 134,238.

The invention is for improvements in or relating to color photography of the class wherein two sensitized surfaces superimposed are simultaneously exposed, and has for its object to render such color photography more simple in operation. According to the invention, a sensitizer for the class of color photography referred to above comprises pinacyanol, pinaverdol, pinachrome, flavasine, and ammonia, mixed with water.

Preferably the proportions employed are as follows:

Pinacyanol	2 grs.
Pinaverdol	6 grs.
Pinachrome	2 grs.
Flavasine	4 grs.
Ammonia .880 . . .	4 ozs.
Distilled water . . .	1300 ozs.

In making up the sensitizer, the first four ingredients in the quantities stated are preferably dissolved in 10 ozs. of boiling alcohol and stirred for ten minutes until thoroughly dissolved, after which 1300 ozs. of distilled water may be added at a temperature of about 70° F., and then the 4 ozs. of ammonia. The film or plate to be sensitized is immersed in this mixture for about five minutes, and kept constantly in movement. The drying should be effected quickly at a temperature of about 75° F.

A plate or film sensitized by this formula is panchromatic. In operation, one such panchromatic plate may be superimposed with a non-panchromatic plate, such as are already on the market, or two panchromatic plates, whereof one or both may be sensitized according to this formula are employed. The two plates are preferably put with the sensitized surfaces face to face, and may be exposed in any ordinary camera. If a non-panchromatic plate is used, this is preferably placed on the lens side of the panchromatic plate.

The two plates thus superimposed are exposed simultaneously, and the first plate cuts out a certain amount of color from the second plate, so that the resulting two negatives represent different color-values, and this difference is made greater by use of the special sensitizer described than is possible with two panchromatic plates, such as are at present obtainable, or one of such known panchromatic plates and a non-panchromatic plate.

The negatives are developed, and from each a positive print is made, one of which may be on opaque paper, and the other on transparent material, such as celluloid. These prints are then toned up to different colors, one, say, to an orange-pink tint and the other to a blue; the orange-pink would be employed for the positive, which is produced from the negative that was nearest the lens.

The marked difference of color-values obtained, owing to the use of the special sensitizer described, leaves room for considerable manipulation of the prints, so that the depth of color of either may be deepened as required to obtain a proper balance according to the subject in hand. This balance can only, of course, be judged by the operator for each subject, and will depend largely upon individual taste, but the fact that a large difference of color-value is obtained by means of this invention in the two positives leaves scope for the desired manipulation.

For quick work the two panchromatic plates prepared with the special sensitizer given above is preferred.

If one print is on paper and the other on a transparent material the transparent print will be afterward superimposed on the opaque print, and the two may then be mounted in any desired manner. With practice, a colored photograph having considerable resemblance to Nature can thus be obtained.

Although plates have been referred to, obviously films may be employed, and also the finished product may be made as a transparency by utilizing transparent material for both prints.

The invention may be applied to cinema films, the celluloid portion of which may be of ordinary manufacture, but the sensitizing material for one or both of the films must be made according to this invention. The two films can then be run simultaneously through the camera, and the subsequent treatment will be the same as has been already described with reference to plates, except that the final product will be a transparency.

Instead of toning the final product to different colors, the film may be stained the desired colors on opposite sides, though for the production of ordinary colored photographs the process at first described must be used. For cinematograph work the staining is possible because of the persistence of vision and the strong light behind the film.

Where two panchromatic plates, sensitized according to this invention, are employed, the color-values are still more widely different, owing to the amount of color which is stopped by the plate nearest the lens, and this is sometimes an advantage, as it enhances the ease with which the strength of the different tints can be adjusted one to the other.

Methods of Coloring; Print-out Formulas

The public of today shows an ever-increasing interest in color, and the Kodak Company and large stores, being alive to this fact, arrange "color feasts" to arrest our attention. Photographers are sure of a draw if they introduce just one striking picture in color in their window, not necessarily a figure subject: a local scene at its best, a sunset or a war photograph in color is suggested. Passing a studio window at the seaside last summer, I was obliged to turn back because a strong seascape was shown merely toned blue. A colored enlargement of a hotel fire was a great draw for another maker of portraits.

Thinking that many photographers may have recognized this fact and are wishful of trying their hand, it is proposed here to review the various processes of applying color, with the suggestion that my readers should take up one method, practicing it until mastered. It is also hoped that those who have started will find some hints and assistance. Each of the processes has its advantages and disadvantages; the easy ones are limited; others with a wider range, such as solid oil painting, require study and practice.

Mediums

To save repeating the formulæ for mediums I will deal with them first, because wax is useful with several and casein with all methods.

No. 1

Artists' prepared oxgall	20 drops
Methylated finish	1 oz.
Water	2 ozs.

The spirit makes the above milky, but is not detrimental to its usefulness; if you can get pure alcohol all the better.

No. 2

Gum senegal	$\frac{1}{4}$ oz.
Water	2 ozs.
Methylated finish	1 dr.
Acetic acid	10 drops
Sugar	1 dr.

Lump senegal is best, and should be dissolved first by soaking it in 1 oz. water. Useful with water colors on glossy paper.

No. 3

Casein paste	2 ozs.
Methylated finish	2 ozs.
Glycerin	3 drops
Carbolic acid	5 drops

As the uses of casein are so little known to artists some description of it is necessary. A proteid obtained from cow's milk by removing fat, the precipitated curd is washed and dried, forming a yellowish substance like fine sand when finely ground. The best qualities are used as food, the coarser kinds for cements and wall paints. We are only concerned here with the insoluble variety, which is made soluble in water by a number of agents, *e. g.*, caustic soda, ammonia, carbonate of soda; but for our purpose borax is best. When ordering or writing for samples it is advisable to state clearly for what purpose you intend to use it. Paper manufacturers make use of it in various ways, and it is used in photographic base paper as a superior kind of size. It is useful as a medium for dyes and water-colors, as a size for bromide paper before commencing in oil color, and as gum will not allow of spirit being added in any quantity, casein is the binding medium for aërograph colors. For the same reason it makes a good fixative; no "tears" are formed, as is the case with gum-water. It is superior to shellac, as the latter, when thinned with alcohol, gives too much transparence to the whites of chalk and pastel, darkens colors and turns black in time.

To make the 2 ozs. of casein paste, take 1 oz. casein, mix it in its dry state with 3 drams of borax, next add enough cold water to cover it (about 1 oz.), stirring all the while. Then add about 2 ozs. of boiling water until a smooth paste is secured, allow to stand a day, when grit and dirt settle to the bottom. If pure alcohol is added a clear varnish is obtained. With methylated spirit it is milky, but when tested on glass it will be found to dry perfectly clear.

For large quantities it is best to soak 1 lb. in 4 lbs. cold water overnight. The water is added gradually and well stirred. In the morning add 15 per cent. of borax and heat up in a steam kettle to 120° F. In this way lumpiness is avoided and a smooth paste secured.

The above will be found more satisfactory than the following:

White cheese	50 gms.
Liq. ammonia to . . .	150 c.c.

Rub the cheese in a mortar to a paste with a little of the ammonia, and then add the remainder. Then add:

Alcohol 50 per cent. . . .	200 c.c.

and place the bottle in a warm place till the sediment has subsided, then filter. *B. J.*, Sept. 22, 1916, p. 519.

No. 4

White wax	½ oz.
Gum elemi	1 dr.
Oil of lavender	40 drops
Alcohol	1 oz.
Turpentine	1 oz.

First dissolve the gum elemi in the turpentine, and then, by means of a water-bath, melt the wax, add the oil of lavender, stir well, next add the alcohol, finally the elemi solution, remove from heat, and stir well until cooler.

Casein, gum senegal, gum elemi, carbon tetrachloride, water-nigrosine black can be obtained from Messrs. Harringtons, Ltd., 4, Oliver's Yard, City Road, London, E. C.

Coloring Postcards

The simplest and cheapest method of coloring is that put forward in *B. J.*, Jan. 19, 1906, for postcards, and considered more permanent than aniline dyes for shop window exposure. The colors were three in number, the simple primaries: "Yellow," an aqueous solution of gamboge; "Blue," an aqueous solution of indigo with oxalic or other acid; and "Red," a solution of dragon's blood in methylated spirit. The red to be used first, the yellow next, and the blue last by means of an "air brush," a camel's hair brush being used for spotting only. Briefly, the three-color process by hand method. Genuine dragon's blood (a resin) is now difficult to get, but a cheap imitation pigment can be purchased. Prepared as a water-color from cochineal lake. burnt sienna and gamboge, no spirit is required. In making postcards, say a flower or view series for coloring, the question of a color scheme should be considered first; one sees attempts at coloring on most unsuitable harsh B. and W. cards.

Coloring with Dyes

The mere mention of dyes suggests the word fading at once, which is very unfortunate, because they are really ideal for coloring slides. The length of time they are exposed to intense light, and that not daylight, is relatively short. Therefore, the question of permanency is not so important, but ease of application and transparency is. The extreme thinness of the tint on prints is no doubt one of the reasons of their being fugitive, as when some of the dyes are put on alumina or similar base they become pigments, with a better reputation.

There is no such thing as an "absolutely" permanent dye, and it should be noted the word "absolutely" is never used by pigment makers; even "permanent" is capable of such a broad meaning that it would take a column of print to define it. Dye manufacturers refuse to give any information regarding the length of time different colors will remain fast to light, and a further difficulty for colorists is the custom of the trade not to give the chemical name of dyes. This fact handicaps me in not being able to say the best stains to use, especially as there is nothing else to use for the after-processes of glazing and celluloid facing. Water-soluble dyes, or "photo-colors," are put up in a variety of trade names and forms—liquid, powder or paper. If you are not likely to use a quantity, about six to eight colors should be purchased in powder form and kept in bottles. They can then be used for a variety of photographic purposes, and mixed with water, gum, casein or gelatin suitable for the work. Intense color can be made if you have the powder form.

When setting a palette put, say, six spots of No. 1, 2 or 3 mediums about two inches apart on a piece of opal; then add a few grains of one color to each drop of medium. By the time other materials are got ready they will have dissolved. Failing opal, ordinary glass with white paper pasted underneath answers well. Requisites are: One small pointed brush and one larger and flat brush, some blotting paper, a piece of fine turkey sponge, a saucer for large washes, and a bottle of weak ammonia water. This latter is for making corrections by bleaching the color, and should not be used unless other means fail to remove the tint. A fragment of blotting paper wetted with the ammonia and laid on the spot is the safest way to remove the undesirable color. Clean water should be applied afterward to wash away the ammonia. If you consider your work a failure, do not throw the print away; put it in running water for an hour or so, when all the color will be found to have been washed out, and on taking up the print again you will make a success of it.

Prints should be unmounted, and in order to make a wash of tint run evenly on P. O. P. or bromide, soak the paper and lay it on glass, take up the surplus water with the sponge, then apply the tint required, made weakly, in a saucer. It is best to deal with the background or largest space first, then the next largest (the clothes), then the hair, finally the face. If the first wash after blotting is not even, while still damp apply the same tint again and work the brush in a rotary fashion, giving attention to thin places, Colors must be kept delicate at first, as they dry out darker and stronger than they appear when wet This point is a technical difference from ordinary water-colors. For small washes and strong mixtures use the palette.

Use blotting paper or cotton-wool wetted and squeezed out, if you wish to prevent dyes acting too quickly. Don't hurry: give the necessary time to build up by repeated washes, and you will be successful, In mixing dyes it is the same as with other colors: the fewer you use the more permanent the result. If, when looking at the work obliquely when dry it appears patchy, the whole of the print should be sponged with clean water and allowed to dry. Sometimes a rub over with methylated spirit on clean cotton wool, or a polish with No. 4, will level it up.

Dyes show to advantage on glossy P. O. P. and on superior kind of bromide and gaslight papers; these require no preparation except the wetting mentioned. Collodion prints should not be attempted, as in trying to achieve the impossible time is wasted; neither do the dyes show such clear tints. "Transparent water-colors," the American name, only stain gelatin papers; on all others they wash off like water-colors. If you must color papers without a gelatin surface, size the print with ¼ oz. gelatin in 5 ozs. warm water, allow to dry, then harden by a dip in formalin bath. Do not use alum; it has a bad reputation for reacting on colors.

Formalin should be used, and not stronger than 10 per cent., or the surface will be horny and repellent. Lantern slides are better for a dip, especially if your brushes are worn. Chinese white mixes well with dyes, gives a wider range of tints, adds to the difficulties, and, of course, not being a dye.

Dry Uses

Once the skill of laying down an even tint of dyes is acquired it can be turned to good account to modify the printing quality of negatives. Say a child in white has been taken, standing on a dark green upholstered chair (the best available in an "at-home" portrait), and the negative is too contrasty, the quickest way out of the difficulty is to tint the chair in the film a weak yellow tint. In out-of-door portraits, such as a dark girl against foliage in shadow printing the same value as the dark hair, and giving no relief, a mere tint over the foliage in the film will work wonders. Wet the plate and use a weak gamboge tint, because the colored wash, by reason of contrast, shows better where the tint is being carried. One trial of one tint will be a guidance for further work. If the negative is not soaked it soon dries.

If the photographer is nervous of tinting the film, try a yellow dye with No. 3 on the glass side. As No. 3 contains spirit it dries more quickly than gum. Use the dye in powder form; it soon dissolves in this medium. The glass must be clean, and, of course, the more of No. 3 used the thinner the color. Having made the tint you think will answer the purpose, paint or float over the back of negative, wait half a second for the spirit to evaporate, and while the paint is tacky wipe off where not wanted. When the first tint is dry, a further wash to strengthen the tint can be made with a brush, or the tint dabbed on with cotton-wool. Shading during printing has its limits; even the tissue-paper dodge takes time to arrange, just for one awkward spot in the negative, therefore those who have not tried paint on back of negatives should refer to *B. J.*, July 5 last, for further details.

Contrasty negatives and blocking-out hardly come under the heading of coloring methods, but while on the subject of dyes I wish to point out their use to photographers. Water-nigrosine black in powder form, made into a creamy paste with No. 3 and applied, makes an effective blocking-out paint. It soon dries and smoothly, does not stand up in ridges or relief like a more solid opaque paint, and has the appearance of a more workmanlike job.

The method of cream-toning prints by means of a hypo bath is well known. When changing the color of a mount, it is best to have two dishes, one filled with cold water and one with the selected color. First dip the mount in the cold water, going over the same with a large brush or with cotton-wool, to remove air-bells. Then quickly transfer to the dye bath. The more quickly it is done and blotted the better. Avoid soaking or any rubbing of the mount, otherwise, if three-ply cardboard, it will blister and separate.

Spirit Dyes

Vast quantities of fancy goods are decorated with dyes soluble in spirit, stencilled goods with the air brush, photographs by the rag and rub-on process. Mr. Newman Horne's finishing method with spirit nigrosine and alcohol, together with 10 per cent. of chloral hydrate added to soften the gelatin, could be extended to other colors.—BURLINGTON in *B. J.*

Repairing Blisters in Enlargements

BROMIDE enlargements are sometimes discarded owing to the occurrence of blisters either before or after mounting or which have developed after heat has been applied in dry-mounting, but the following is a remedy which has repeatedly been found very effective.

With a soft pencil mark very faintly round the edge of the blister, and then with a sharp knife cut just deep enough to go cleanly through the film, following the mark of the pencil, but not completely round to the starting point. Just enough of the disc of film should be left unsevered to allow of the film remaining attached to the print. A very sharp knife is necessary to ensure a clean cut, for it must be remembered that the film has to be laid down again in exact juxtaposition.

The disc of film having been turned back, laying bare the paper below, this latter is moistened with a little clean uncolored adhesive (such as artists' gum water as used for mixing with spotting colors), and the cut-out piece of film is laid down again and pressed firmly into contact with a piece of blotting-paper.

Sometimes with small blisters it is necessary only to moisten the loose piece of film with water in order to obtain good contact on pressing it down again.

If the blister has not been cut to the edge, or rather to the extent of the air-space between the paper and the film, the gum must be inserted underneath with the brush.

When thoroughly dry the spot should be cleaned with pumice powder, and if the film overlaps it should be knifed down.—*B. J.*

Two Useful Cements

For cementing any hard material, such as broken porcelain or glass, which is not required to stand heat, a very useful cement is made as follows: Gelatin is soaked in its own volume of water for three or four hours at a moderate heat, an equal volume of glacial acetic acid added, and the whole heated till thoroughly homogeneous. It should set to a stiff jelly on cooling, and if not, more gelatin should be added and the whole reheated. The surfaces to be repaired should be dry and clean and heated, the cement being applied warm with a strip of wood. The surfaces should be squeezed together and the article bound up with twine and left overnight to set. The excess can be washed off by means of a cloth and a little hot water. Where the article has to stand the action of hot water, the best cement is bichromate glue, which is made as follows: Soak ordinary glue overnight in water and pour off the excess. Melt the glue by standing the containing vessel in a pan of boiling water. To this add about one-tenth its weight of bichromate of potash in a finely powdered state, and maintain the whole at a good heat till the salt is dissolved. The blue is applied as before, and to assist the hardening it should be exposed to light.—*The Amateur Photographer.*

The Art of Negative Making

Some few weeks ago an advertisement appeared in these pages for a "negative maker." Without asserting that such an advertisement never appeared before or since, as a cover-to-cover reader of photographic literature I have only seen the one, and in a long and chequered career have only met three craftsmen whose work consisted purely and simply of negative making. And yet in the quality of the negative lies the secret of good photography and on the making of it hangs the smooth running of much of the after work.

A fellow "pro." once remarked to me that the customer did not see the negatives, and so if the prints were all right nothing further mattered. I pointed out that customers don't usually see beyond the reception-room and studio, but that was no argument for a cramped or leaky dark room.

Bad negatives are discouraging in their very appearance. They increase the labor of retouching, they use up the printers' time and temper, and they waste paper and developer. And there are more bad negatives made than good ones. I might go further and say that a really good negative—a negative that strikes expert and tyro as decidedly good at a glance—is exceptional.

Now the making of a good, an undeniably good, negative is by no means a difficult process. It requires neither genius nor luck, for before the days of tank development, artificial light, and plates of the high-velocity type, good negatives were common. Anyone who has seen and handled professional negatives of thirty years back will endorse this.

It would seem, therefore, that slow plates, dubious daylight, and cumbersome methods of development are necessary for good results, while tanks, half-watt lamps, and fast plates are responsible for the unreliable negatives that most printers know only too well. Slow plates certainly have advantages that are not universally recognized, and the desire for "speed" is responsible for much poor work, but good negatives can be made on any plates more easily by modern methods than by the laborious means that the old school was dependent on. It is only necessary to give the modern methods a fair chance and not to expect impossibilities to see how much superior they are in every way.

The beautiful negatives of thirty years ago were—many of them—made in spite of the prevailing conditions: they simply had to be good, for any imperfections would be faithfully reproduced in the prints. Just as there were no fast plates or electric light to overcome dark days, so also there were no extreme grades of papers to "cover up" faulty negatives. The advantages possessed by the modern photographer should mean improved negatives, but they offer a clue as to why the improvement is exceptional rather than the rule. Under the old conditions it was imperative to take negative-making seriously. A badly exposed or wrongly developed plate was equivalent to a re-sitting. Negatives that were impossible in appearance were usually considered impossible for printing, hence they were discouraged. With present-day methods the same anxiety is not necessary, but no methods are entirely automatic and a modicum of care is essential with any methods to ensure correct results.

A perfect negative might be described as one of a well-lit subject which had been correctly exposed and developed. Lighting is, of course, an artistic function, and as every artist has individual ideas (without which there would be no art) I will pass over lighting with a solitary hint. When the required effect is difficult to get, owing apparently to sheer cussedness on the part of the daylight, it is sometimes useful to photograph a white background—making sure it is white, no mixed tints or uneven patches—with a very short exposure, the lighting being arranged as evenly as possible. Any unsuspected unevenness in the light will show up surprisingly on the negative, and by its aid can be traced and remedied.

Daylight exposures are generally reckoned by the process of mentally "reading" the light, a practice which requires much experience to become expert at. Approximately correct exposures for any time, any weather, can be calculated with the assistance of one of the many exposure reckoners on the market. True, these reckoners do not include a section for studio work, but the exposures advised for "indoor portraiture" divided by some particular factor will be found suitable. The factor can be found by experiment. For instance, suppose six seconds is advised at *f*/8 with such and such a plate under such and such conditions, and two seconds is found to be correct by experiment in the studio under identical conditions, then all calculations from the reckoner should be divided by 3.

Artificial-light exposures are less variable and can be kept well in hand by the occasional use of an experimental plate. It should be remembered, however, that an exposure that is correct for a full-length "sketch" of a lady in white is not sufficient for a black-coated bust against a dark ground.

Tank development is a process that makes us wonder what we did without it. The development of a couple of hundred plates is now a vastly different thing from what it was, and the ease with which plates can be put through is no small consideration, particularly when no risk of bad results is entailed. If the important details of tank work are neglected, however, there is a big risk.

The details I refer to are accurate compounding of the developer, thorough mixing and careful dilution, time, and, last but certainly not least, temperature. To take them in the reverse order, temperature is more likely to trip up a careless worker than anything else. I remember once asking an operator why he did not use a thermometer. He replied that the hot water he used to dissolve his sulphite "just brought the tank up to the mark." This occurred on a frosty night. The following August he was still proceeding on the same lines, oblivious to the fact that "the mark" had risen some thirty odd degrees.

A slight mistake in time is not so serious, but it is very little trouble to keep both time and temperature exact.

Developing formulæ and dilution are matters of individual choice; any developer at any strength in reason will produce fine negatives if used deliberately and with intelligence.

Negative making is considered by some as ended with the fixing. Others include reduction and intensification, while others bring in retouching and other artistic or mechanical treatment. To go into them all would be too lengthy, but a passing word on each will not be out of place.

Reduction of harsh negatives is often carried out with Farmer's formula when the correct thing would be persulphate. The reason for this is probably that persulphate needs a little coaxing; sometimes it seems to hang back, sometimes it needs acidulating. Intensification still goes on with mercury-ammonia in spite of all that has been said and written on the advantages of bichromate. For those who haven't bichromate handy, mercuric iodide is far superior to the chloride and much simpler and safer. It consists of one solution only, it does not demand careful washing out of hypo, it seldom stains, and, besides being a useful intensifier, it will also detect improper fixation by whitening any invisible silver thiosulphate which can then be fixed out by re-immersion in hypo.

Leaving retouching alone as far as these remarks are concerned, I would still like to point out that where an aerograph is handy it can be turned to distinct advantage on certain negatives. Copy negatives can be vignetted and sketchy backgrounds strengthened with an aerograph in as many seconds as it would take minutes by any other means. For this work red dye is preferable to paint, though it has the disadvantage that it will not rub off if required.—*B. J.*

Making Enlargements from Film Negatives

It has been the common practice of many photo-finishers in making enlargements from films to sandwich the negative between two layers of glass, in order to keep it perfectly flat.

But this process does not give as clear and as distinct a copy as one is warranted in expecting to get from a good negative. There is invariably a fuzziness about such projections, leading one to believe that the negative was not properly focused; whereas, this is caused by the light passing through the glass being diffused, resulting in the undesirable fuzziness. A familiar example of this refraction is decidedly marked when a stirring rod is placed in a graduate filled with water. The rod has the appearance of being bent.

In making enlargements, this diffusion occurs only when there is a glass placed between the negative and the easel. Such diffusion not only affects the clean sharpness of the enlargement, but also has a tendency to flatten it. Therefore, to get the best results in projections, be careful that there is nothing to divert the rays of light after they pass through the film negative.

Where quantities of enlargements from the same negative are to be made it is advisable to cut a mask from pressboard, of the proper size, and tip the edges to the glass. This board is of the right strength to keep the film taut.

This scheme will do away with the necessity of using two plates, and permit projections directly through the film, with the result that the finished enlargement is much clearer and more pleasing.

Try this the next time you make enlargements and see if you are not well satisfied with the change.

Fumes and Dampness

Work rooms should be well ventilated at all times, but they are less likely to be well ventilated in damp than in dry weather. In damp weather it is very important that the stock of sensitized paper be stored where it is dry and where there is little chance of gas fumes reaching it. By gas fumes we mean the fumes of coal fires, of coal gas, natural gas or such fumes as are produced by the old method of silver recovery with sulphide, or the sulphide toning process.

The zinc method of silver recovery does away with sulphide fumes and should be used in all cases where it is necessary to recover silver in the studio. Fumes from heating gas may be overcome by keeping paper away from stoves or places where gas is used and by having cabinets for the storage of paper near the floor, being quite certain that the floor and the cabinet in which the paper is stored are quite dry.

We have seen perfect prints made from paper that was several years old and we have seen comparatively fresh paper that had been ruined by exposure to gas fumes, the result being the same as fogging. With proper storage developing-out papers will keep in perfect condition for a very long time.

Once the paper has been properly stored it is bad practice to open a package, remove the wrappings and expose the entire amount of paper to the damp air of the work room when only a few prints are to be made. Work rooms are usually damp and if paper is exposed to dampness for any great length of time it will become desensitized in spots, while prints that have been exposed but not developed will lose a considerable portion of the latent images that have been impressed upon them if left for any time before development.

To be perfectly safe, develop prints as soon as they are exposed. If a work room is at all damp, do not leave exposed prints for as much as an hour before developing, and never allow exposed prints to stand over night for development the next morning. If paper seems to lack sensitiveness, don't blame the paper. Look for dampness. Try another lot of paper that has not been opened and dry out the paper that has become damp.

A dry cabinet for paper should be air-tight. If it is not, any dampness in the air will get into the cabinet. Of course moist air will enter the cabinet when the door is opened, but this can be overcome by placing a box of calcium chloride in the cabinet. The box should be a tin one with perforated cover. As soon as the calcium chloride becomes moist it can be dried out by heating and replaced in the cabinet. These few precautions will obviate a lot of unnecessary trouble in damp weather, will save time and material and keep your temper even.—*Studio Light.*

Photographic Materials and Processes

Photographic science; Studies in ——. H. J. Channon. Phot. J., 1920, 60, 164—173.

The effect of intensity variation on contrast is not regular but is a function of the plate. With very weak intensities the maximum density obtainable with very prolonged exposures is a function of the intensity and of the plate, but is generally much smaller than the density obtainable by an equal exposure of short duration and high intensity. Reversal can be produced by continued exposure to a weak intensity after production of a latent image by normal exposure. A similar reversal can be produced by exposure to (not necessarily contact with) metallic zinc, with the difference that if reversal is produced by light action the plate sensitiveness is destroyed, but not if reversal is produced by zinc. The production of a positive by development in white light is shown to be partly due to the screening effect of the image first formed, and partly due to an actual loss of sensitiveness by the exposed and partially developed film. A number of experiments are described, for details of which the original paper should be consulted.

Photographic sensitizers; Studies on ——. *I. The isocyanine dyestuffs.* W. H. Mills and W. J. Pope. Phot. J., 1920, 60, 183—198.

Several members of the isocyanine class of dyes, produced by the condensation of 1 mol. of a quinolinium alkyl-iodide with 1 mol. of a quinaldinium alkyl-iodide have found important use as color-sensitizers of photographic emulsions, the best-known being Pinaverdol (British, Sensitol Green). Their general constitution is probably best represented by the formula $(R)N.C_9H_6(4') : CH.(2)C_9H_6.N.(R)I$ (see also Mills and Wishart, Trans. Chem. Soc., 1920, 117, 579—587). The preparation and properties of 20 isocyanines are described, all of them having been examined as to their sensitizing effect on photographic plates by bathing in a solution of 1:75,000. The parent body (1.1′-dimethylisocyanine iodide) is a strong sensitizer, sensitizing up to about 6400; the introduction of a third methyl into the 6-position gives a still stronger sensitizer (Pinaverdol). The replacement of the first two methyl groups by heavier groups (ethyl, *n*-propyl, and *n*-butyl) reduces the sensitizing effect in increasing amount. The introduction of a third methyl group into the 6′-position reduces the sensitizing effect, as does also the introduction of two more methyl groups into the 2′- and 6-positions, or of a cyano or phenyl group into the 2′-position. The 1.1′-diethyl compound (Ethyl Red) is similar to the 1.1′-dimethyl compound, but a somewhat weaker sensitizer, and the addition of other radicles into it has a similar effect. The introduction of the amino-group into the 5-, 6-, or 6′-position in 1.1′-dimethylisocyanine iodide increases the sensitizing power to about the same extent in each case, but the introduction of the acetamino group has only a slight depressing effect in the 6′-position, stronger in the 6-position, and very strong in the 5-position. The effect of the cinnamoyl-amino group in the 6-position is less than that of the acetamino group. The 1.1′-diethyl-6-ethoxy-6′-methoxy compound is a strong sensitizer, corresponding with the German Pinachrome.

Light-filters; Preparation of ——. G. Potapenko. Z. Wiss. Phot., 1919, 18, 238—239. Chem. Zentr., 1919, 90, III, 307.

The most suitable form of light-filter for Uviol lamps appears to be stained gelatin film. The usual method of preparing these, viz., by coating glass with gelatin solution containing the dye, drying, and stripping, is described.

Auramine as a sensitizer. O. Bloch and F. F. Renwick. Phot. J., 1920, 60, 145—146.

Auramine, when used by itself, has very slight effect on the color sensitiveness of silver gelatino-bromide plates; the effect on gelatino-chloride plates is, however, very marked, a new band of sensitiveness to the light blue being added. In conjunction with dyes of the isocyanine class (*e g*.., Sensitol Green—German "Pinaverdol") or of the quinocyanine class (*e. g.*, Sensitol Red—German "Pinacyanol") there is marked enhancement of the sensitizing properties of the latter dyes in regions of the spectrum for which auramine itself does not sensitize at all. The amount of auramine required is much less than is required to produce a definite color-screening effect. The auramine also restrains the logging tendencies of the isocyanine dyes. Spectrograms are given illustrating the effects obtained.

Theory of organic developers. B. Homolka. Korr., 1919, 56, 387—391. Chem. Zentr., 1920, 91, II., 660.

The loss of developing power by the introduction of a carboxyl group into pyrogallol in the formation of gallic acid is explained by the formation of an anhydride by the carboxyl group and the hydroxyl group in para position to it. Pyrogallolcarboxylic acid and catechol-*o*-carboxylic acid, in which such anhydride formation is not possible, are both developers.

Photomicrography with simple apparatus. T. J. Ward. Analyst, 1920, 45, 130—133.

For magnifications up to about × 4 the camera is fitted with a short-focus (10 to 12 cm.) single meniscus photographic lens, whilst by placing a large diameter lens on a support between the camera lens and the object magnifications up to about ×8 may be obtained. For magnifications up to about ×75 the camera lens is replaced by a microscope objective fitted into a cork. For most purposes "ordinary" plates are the most suitable.

PATENT NEWS

Strong (photographic) prints from weak negatives; Process for producing——. G. Staess, Berlin-Steglitz. Ger. Pat. 316,087, 1.5.17.

A thin film of transparent gelatin or celluloid, colored red by means of potassium ferric oxalate and ammonium thiocyanate, is interposed between the negative and the printing paper. This is bleached as printing proceeds in inverse proportion to the density of the negative, and the effect of printing under a steeper negative is obtained. The bleached film regains its color on storing in the dark. The amount of intesification obtained many be reduced by partial bleaching of the film before printing or increased by using two or more films.

Photographic color process; Theoretical basis of a new direct——by means of colored substances. P. R. Kögel. Phot. Korr., 1919, 56, 332—337. Chem. Zentr., 1920, 91, II., 511—512.

The process depends on the fact that only absorbed light is chemically active, so that a colored enolic compound which is changed by light into a colorless keto compound is affected only by light complementary to its own color. The sensitive film, dark brown in color, consists of a mixture of three enolic substances, yellow, red, and blue; it bleaches right out in white light but leaves the corresponding color when acted on by colored light. Sensitizers may be added to the mixed colors, and the pictures may be fixed.

Manuscript, typewritten or printed matter, drawings, photographs or the like; Reproducing (photographically) ——. S. J. Waters, Esher. U.S. Pat. 1,327,931, 13.1.20. Appl., 9.11.18.

A stencil for the reproduction of manuscript, etc., is obtained by printing through the matter, or through a negative of it on to a thin sensitized film, transferring the film to a temporary support for development, etc., and then transferring it to a final backing of fine texture.

Photographic printing paper and process of making the same. T. P. Middleton, Assignor to Kerotype, Ltd., London. U.S. Pat. 1,329,918, 3.2.20. Appl., 24.4.19.

Non-inflammable films or filaments for kinematographic and other industrial purposes; Manufacture of ——. W. J. Stevenson, London. Eng. Pat. 138,379, 21.8.18. (Appl. 13,569/18.)

A non-inflammable, impermeable, durable, flexible, and transparent film is obtained from a solution of cellulose acetate, preferably in tetrachloroethane or benzyl alcohol, containing also triacetin and triphenyl phosphate; the amounts of the two latter are about equal and may vary from 10 per cent. to 30 per cent. of the weight of the cellulose acetate.

Colored photographs or kinematograph films; Producing ——. W. Finnigan, London, and R. A. Rodgers, Hove. Engl. Pat. 138,396, 7.1.19. (Appl. 420/19.)

A negative is taken through a translucent colorless screen, such as ground glass, in contact with the sensitive film, and a print is obtained from this negative on a sensitized material provided with a colored dotted screen film between the base and the sensitive film.

Sensitizing with bichromate. R. Mamias. Il Progressio Fotog., 1915, 208. Bull. Soc. Franç. Phot., 1919, 6, 331—332.

Carbon-tissue paper sensitized with bichromate keeps for only a few days. If the normal salt or the normal salt with a small addition of alkali be used in place of the bichromate, the paper keeps almost indefinitely, but is too slightly sensitive for use. The combination of good keeping quality and high sensitiveness may be obtained by coating the paper with a mixture containing slightly alkaline chromate, and then treating it, just before use, for about half an hour in a closed box at ordinary temperature with the vapor of a volatile acid, such as acetic acid.

Wedge color-filter for distant photography. O. Will, Munich. Ger. Pat. 309,167, 28.8.17.

A composite color-filter contains two or more wedge filters, cemented between glass; the different wedges may be of different colors and their slopes may be in the same or in opposite directions.

Colored cinematograph films; Process of producing ——, and apparatus therefor. L. F Douglass, San Rafael, Cal. U. S. Pat. 1,325,280, 16.12.19. Appl., 13.8.18.

In two-color cinematography, with alternating red and green taking screens, a portion of the green screen exposure is made through a blue screen, the proportion of blue screen exposure being increased with increase of the distance between the lens and the object.

Color Photography. D. F. Comstock, Brookline, Mass., and Technicolor Motion Picture Corporation, Boston, Mass., U.S.A. Eng. Pat. 132,580, 15.8.18. (Appl., 13.271/18.)

Photographic films; Hardening —— during development. J. H. Christensen, Sölleröd. E. P. 135,477, 14.11.19. (Appl. 28,287–19.) Conv., 20.11.18.

The hardening effect on the gelatin of developers containing, *e. g.*, pyrogallol, catechol, or quinol is considerably increased by the addition to the developer of substances which counteract the swelling of the gelatin, such as alcohol, carbonates, silicates, etc. The addition of a restrainer such as bromide or a borate is preferable in order to prolong the time of development. A film in relief is obtained from which the unexposed and unhardened parts may be washed with hot water, and which may be used for various printing processes, including color transfer processes.

Colored photographs or kinematograph films; Producing ——. W. Finnegan, London, and R. A. Rodgers, Hove. E. P. 140,349, 7.1.19. (Appl. 28,247–19.)

Two negatives are taken on two plates or films placed face to face, the upper one being an ordinary plate or film and the lower one panchromatic. From these negatives two positives are printed which are colored blue-green and pink-red respectively and combined in register.

Brown tone on development prints; Process for producing ——. C. Schleussner A.-G., Frankfort. G.P. 318,503, 10.8.18.

Light-fast brown tones are obtained by bleaching the developed print, before or after fixing, in a solution of mercuric chloride containing bromide and then treating it with a solution of sodium thiosulphate containing lead.

Gradation of photographic negatives and diapositives; Improvement of ——. J. Rieder, Berlin-Steglitz. G.P. 318,820, 5.4.19.

The picture is provided on the film side with a coating of asphalt, caoutchouc, or similar light-sensitive resin, exposed through the support, and the coating developed with alcohol or acetone, etc. The picture is then treated with an intensifying or reducing solution or with a dye solution, the action of such reagents being modified by the variable permeability to aqueous solutions produced by the top coating.

Pigment (carbon) prints to metal; Process for transfer of —— as etching resists for process blocks. Rotophot-A.-G. für graphische Industrie, Berlin. G.P. 318,687, 26.9.15.

A matt surface is produced on the metal by electrolytic action before transfer of the carbon print; this prevents the formation of blisters.

Photographic films; Production of —— in natural colors. R. Wellesley, Goodmayes, and T. M. Sanders, Sevenoaks. E.P. 140,560, 18.8.19. (Appl. 4053–19.)

Vol. 57. No. 9 September 1920 20 Cents

The Photographic Journal of America

Smithsonian Institution
SEP 8 1920
National Museum

Published Monthly
With Illustrations

Efficiency in the Printing Room

can never be obtained with make-shift or antiquated equipment. A reliable, scientifically correct, modern printing machine is essential in the production of work of highest quality.

The Ansco 11 x 14 Professional Printing Machine is designed for general use. It is easy to install, economical to maintain and uniformly dependable as to light.

PRICES and full description of this Printer and other Ansco professional apparatus for photographic studios will be mailed on request.

ANSCO COMPANY

BINGHAMTON, N. Y.

New York
129-131 West 22nd St.

San Francisco
171-173 Second St.

Chicago
308 N. Michigan Blvd.

Toronto
347 Adelaide St., W.

THE PHOTOGRAPHIC JOURNAL *of* AMERICA

REGISTERED IN THE UNITED STATES PATENT OFFICE

NEW SERIES: WILSON'S PHOTOGRAPHIC MAGAZINE

AN ILLUSTRATED MONTHLY DEVOTED TO THE SCIENCE AND ART OF PHOTOGRAPHY

THE OLDEST PHOTOGRAPHIC MAGAZINE IN AMERICA
Founded 1864

Incorporating:
The Philadelphia Photographer The Photographic World

THOMAS COKE WATKINS, Editor

CONTENTS FOR SEPTEMBER, 1920

Composition in Portraiture . . . . . "Professional" 335
Soft Focus Lenses—Their Use and Abuse . . . . . Flambeau 342
Expression and Likeness 346
Editor's Table—"Better Business"—On Having a Method—Discontent 347
The Studio—Practical Papers on Studio Work and Methods 350
Abstracts and Translations . . . . . E. J. Wall, F.R.P.S. 354
Views and Reviews 356
The Workroom 359

YEARLY SUBSCRIPTION, in advance, postage paid, United States, Mexico, Cuba, Philippines and Porto Rico, $2.00; Canada, $2.35. Countries in the Postal Union, $2.75. Single copies, 20 cents.

REMITTANCES may be made at our risk by money order, check, draft, or registered letter.

SUBSCRIPTIONS begin with current issue.

Published by EDWARD L. WILSON COMPANY, INC.,
THOS. C. WATKINS, President. 701 Arch Street, Philadelphia, Pa.
EXECUTIVE and EDITORIAL OFFICES, CAMERA BUILDING, 122 EAST 25th ST., NEW YORK CITY
HOUGHTON'S, Ltd., London, Eng., Agents for Great Britain
American News Co., Distributors for U. S. Kodak Australasia Ltd., Sydney, Agents for Australia
RICHARD HILL, Devonport, Auckland, Agent for New Zealand

Entered at Philadelphia Post-office as Second-class Matter

This is one of a series of sketches on Leading American Photographers

American Photographers

GEO. W. HARRIS:—In Washington, D. C., where great men get together, Geo. Harris, founder and manager of Harris & Ewing, has established a unique organization that is known the world over.

Without a doubt, George Harris makes portraits of more international celebrities than any man in the world. Presidents, congressmen, visiting regents and notables from the four corners of the earth, sit before his lens. As a member of the president's party to France, he made a remarkable collection of portraits of delegates to the peace conference.

Holding various offices in the P. A. of A. (including that of president) and lecturing and demonstrating on convention platforms, George Harris has willingly and helpfully served his fellow-craftsmen.

It has been our pleasure to supply Mr. Harris with all his lenses. In his studio, he uses the Vitax F:3.8 and Verito F:4; in his home portraiture and News Service, the Series II Velostigmat F:4.5.

When Geo. Harris attended the peace conference he took with him one lens, with which he photographed seventy-three delegates to the conference. This lens was the Series II Velostigmat F:4.5 shown here in Barrel.

WOLLENSAK OPTICAL CO.

ROCHESTER, NEW YORK.

$100.00

DEPOSITED IN A NEW YORK BANK, WILL BE PAID THE EXPERT NEGATIVE RETOUCHER THAT CAN RETOUCH A NEGATIVE WITH A STIPPLED EFFECT, EQUAL IN FINENESS, SMOOTHNESS AND REGULARITY AS IS DONE BY THE

ARTOGRAPH

TRADE MARK.

SCREEN

Pat. Pending

THE LATEST AND GREATEST LABOR-SAVING DEVICE.

For Professionals. :-: For Amateurs.

NO Time—NO Skill Required.

IF YOU WANT TO SAVE MONEY AND PRODUCE SUPERIOR WORK

SEND FOR ONE TODAY!

Endorsed by Sarony and other high-class photographers.

Sent on receipt of price: 5 x 7, $3.50; 8 x 10, $5.00

The Artograph Screen Co.
500 Fifth Avenue New York City

For Sample Photo send 15¢ in stamps

Sent Complete with Cambination Pink Films that Produce Results

---

HEYDE'S ACTINO PHOTO-METER

Eliminates Guessing in Photography!!

The simplest, most effective and most accurate instrument for determining correct time for exposure.

Easily and quickly manipulated; compact and always ready for use.

No Sensitive Paper Used For Tinting

Exposure table complete on dial.

Essential to the Photographer who wants perfect pictures.

Order by mail or from your dealer. Write for descriptive booklet.

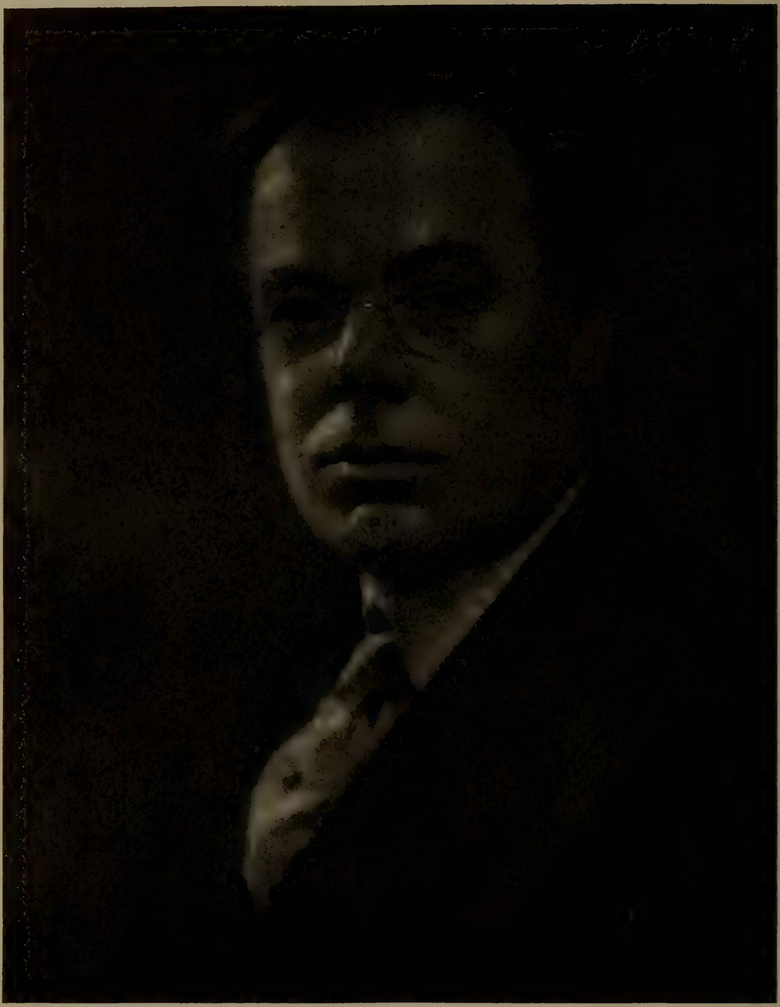
New Vest Pocket Model

Size Dia. 2-3/8" x 13/16" Thick

Price $10.

Dealers: A postal will bring our special offer.

HERBERT & HUESGEN CO.
18 East 42nd. Street
NEAR 5TH AVE., NEW YORK.



RYLAND W. PHILLIPS
BY THE HOFFMAN STUDIO
PHILADELPHIA, PA.

The
PHOTOGRAPHIC
JOURNAL
of AMERICA

VOLUME LVII SEPTEMBER, 1920 NUMBER 9

THE AUTHORITY FOR THE PROFESSIONAL PHOTOGRAPHER
PJA
FOUNDED 1864

Smithsonian
SEP 8 1920

COMPOSITION IN PORTRAITURE

By "PROFESSIONAL"

IN ARRANGING the composition in portraiture have the *general* run of lines conform to the shape of the picture—up and down in a vertical, from side to side in a horizontal, or in curves if the composition is destined for a circular or elliptical arrangement. This does not necessarily imply that these lines should be unduly prominent. Even the Hogarth line, which adds grace and beauty to any composition, must not be too assertive, although it may be stronger than a straight line. The latter, which gives dignity and strength, as well as stability, should not, on account of its great attraction, be used more than necessary.

A position very much employed by photographers in "bust" portraits is one where the body is turned considerably to the side. The further shoulder and side of the body is, to a great extent, not seen in the picture, while the near shoulder is exactly or nearly facing the camera. If the sitter is portly, and sometimes even if not so, provided much of the back shows, this pose will give the figure the appearance of stooping. The pose is then either moderated, the figure more reclining, or the print is cut quite close on the faulty side. However the figure is posed, an *oblique and prominent broad line* will run from the head and in front of the picture to the lower corner on the opposite side from that in which the head is located.

When this is the case the picture will lack balance, even though the prominence of the line is kept down by a judicious use of the ground and lighting, unless the *axis* of the composition is *opposed* by the line or lines of sufficient force to counteract it. This may be done in a variety of ways. It is most effective when these lines are opposed to the strongest or most attractive part of the oblique line, as it brings the correcting line nearer to the part that needs balance, rather than at the diagonal and toward the extreme ends of the picture, although, of course. it can be and is, however, frequently so balanced.

When the pose is that of a lady, the arm nearer the camera is frequently used for the accomplishment of this purpose. The forearm from the elbow to the hand can easily be posed in a variety of ways to form an opposing line of good weight in attraction, and being located near the centre of the line, it would extend across the same where most needed. Care, however, should be taken that the arm is not so posed as to be too prominent, or by receiving an undue amount of light to suggest inaccuracy in drawing or foreshortening. We always have the arm to fall back upon, but the advisability of its *sole* use in balancing the oblique line would be frequently questioned, as, for instance, if only the bust pose is desired, and not more of the body. In this case the hand and arm might be better introduced.

If the subject still is that of a lady, and it is not desired to show so much of the seated figure, then, perhaps, the hat, if suitable, could be introduced as an aid. The head bent slightly in the opposing direction will, with the hat, do much toward restoring the balance. The balance can further be improved by introducing a fairly strong light, *a la silhoutte*, at and following the line of the shoulder against the ground at the back of the head. With this slight bend of the head, assisted by this little light, and some slight arrangement of the drapery at the front of the dress, we apprehend sufficient balance could be effected to suffice.

In the case of a man, the line of the upper pocket in the coat, assisted by proper arrangement of a handkerchief, slightly shown, and the line of the coat collar at back of the head, together with a little of the shoulder, which make a forceful line, can all be made helpful.

Counter lines or suggestions of elongated small masses of spots may be introduced by working on the background of the negative (on the glass side) near the strongest point of this oblique line.

A square picture which will photograph not too strongly may be introduced in the picture ground.

The oblique line is important, and if too strong must be balanced. This may be accomplished by accenting other lines.

In strengthening the line back of the head and a little down on the shoulder to restore balance it should not be made so prominent as to interfere with ready "concentration of interest" on the face. It will, if properly done, assist in this concentration.

Look up one of your old photographs posed in this way, where the balance is not quite what it should be, and experiment upon it with your moist tubes of water color, white and black, mixed in proper proportions, or pure, as the case may be. Note the various effects obtainable by working over these and other parts of the picture. When you make the pose again, you will more readily and speedily work a solution of the problem at the time of arrangement without resorting to subsequent treatment of the negative.

Avoid parallel lines unless insignificant. If so prominent as to be offensive rearrange them. We do not personally object to their occasional use, although many of the writer's friends disagree with him in this respect, claiming that *all* lines that are at all similar should be changed.

Balance *all prominent* lines by counter lines, but not necessarily by right-angle ones—in fact, the occasions on which they will be required are rare. Be careful to avoid symmetry which is objectionable in art. Because you have one line here running one way, don't plan to have another contrary one to offset it, and so on, balancing each one by another; they become unduly assertive when treated in this way. They are likely to make your composition to some extent resemble a checkerboard. *One good line balances a lot of smaller ones of less weight.* Remember, vertical lines add dignity and strength; horizontal, repose; diagonal and opposing, action. So don't kill the power and force of your lines by overdoing things. Study it out, and do not, except in cases of necessity, employ opposing lines that may tend to kill the character of the arrangement.

"Line is not the chief thing in drawing. It is color. In nature there is not such a thing as line. Objects may appear in strong relief, or softened so as hardly to be seen. They may have a round, square, or flat edge, but the supposed line is nothing but a distinction between colors.

"A white hand even may appear to have a sharp outline, but this is because of the contrast of the coloring of the flesh, and the clothing, etc.

"In painting, line and its correct drawing may be said to have a real existence, but that it is primary and all other features secondary, is an extravagant expression from partisans of this view.

"Color may be said to be the symbol of life, for so associated is it, in our minds, with animation, virility, growth, power that its absence means the presence of death.

"True form may exist in a way independent of color, as in charcoal work, etching and engraving and so the blue of smoke and clouds, the green of the ocean, the sheen of a silk or a rug, may be expressed with little or no line, but in the main one is dependent upon the other, and both are necessary features of painting.

"In music harmony is for the present, at least, the final word—nothing beyond it—and so color harmony is now the loftiest pitch to which the painter may attain."

The above quotation, from John Charles Van Dyke, which refers to the painter, is also to a great degree applicable to us, as producers of pictures in monochrome—for color—with its values, and "texture" (which will be mentioned later on) play a part equally important in our work. It is a great mistake to think, because we work in monochrome, color values, tones, etc., are not quite possible with us.

To quote Van Dyke again—from *How to Judge a Picture:*

"Beware of bright pictures, for they are generally bad. This caution is for the *great* majority of pictures. Of course there are exceptions." . . . "It is worth while to give more attention to the low-toned, deep-toned, and rich-toned pictures than to those pictures pitched in high keys."

Equally true is this in our work. Very rarely indeed in professional portraiture does it occur that photographs in high keys are a success. Our monochrome results make us even more dependent on color values than in the painter's art.

To judge solely from the work widely made throughout the country, and more especially from that sent to our various exhibitions, where it is to be expected that it embodies the best understanding and ability of the makers, the writer feels that there is great need of a better understanding in our profession of "color values" and "tone," and the possibility of their practical attainment. Although from year to year it is noted that a larger number of our exhibitors are progressing in the principle of art (which is immediately noted and commented favorably upon by those who have for years been noticing their work), yet there are many who always attend conventions, seriously inclined and very anxious to improve, who do not seem to grasp this elusive thing so very needful to their advancement. There are others who exhibit the same class of work year after year, keeping abreast of the times in technique, various novelties, etc., and yet "stand still," at least as far as progress in the art is concerned. They may show new positions, or possibly a growth in breadth or simplicity of treatment, but the faces of their portraits show the same old style of work that they have been making for years. Many of these men are so grounded in genuine and unmistakable knowledge of photography, by their many years of study and practice, that I am fain to believe it does not occur to them as possible that *all* of us, *the writer most certainly included*, could at times sit at the feet of some of the younger men in photography, and drink from their knowledge to our own decided advantage and advancement.

There are, however, a few men whose work and ability in the old school of photography is such that we must not class them with the larger body of unprogressive photographers. There is a difference and a vast one. This latter class is fully cognizant of what is known as the "new school," its aim, and how its work is produced. They show it not only by their arrangements in composition, etc., but in many other ways. They do not *believe* in the new work as a whole, and have an honest opinion on the subject, but their regular work is founded on lines compatible with the newer methods, and, *to a very limited* extent, as far as they approve of the principles, they permit themselves to go. With these men it is not lack of information that is at fault, but solely that of not being in harmony with the more modern class of work. To these men these remarks will probably fall upon stony ground, but to the seeker after advancement the writer very much hopes that there will be something here that will clear the atmosphere to the extent, at least, that it will set him in the right direction. We all, at times, need to be steered correctly, and even then are prone to go astray.

Color values, in brief, mean the production in pictures of the various values of all the colors observable in life or the original. In a strict sense this is only possible of attainment by the artists of the brush.

In monochrome pictures of one tone, it means the reproduction in this one tone of the values of various colors separately, and in their relation to each other. This is possible, however, only to the extent that their luminosity impresses us with the handicap incident to the incorrect rendering of their luminous values, due to the limitations of our plates. The special plates made for this purpose do much to lessen this error, and, if worked for all that is in them, values in our one tint would on the whole, we think, be as nearly correct as most color combinations seen even in some of the highest class of paintings. These are often faulty in this particular, although great in other ways.

Now, a few words as to the various kinds of plates prepared for the purpose of more correctly reproducing the luminosity of these colors, holding back those which photograph too quickly, and permitting quality to be obtained elsewhere. They permit the reproduction of light golden hair more nearly as it should be. They save very light and at times colorless eyes from being practically lost. These plates are variously known as the panchromatic, orthochromatic, etc.

Some of them are especially prepared for landscape work, and others for portrait work in the studio. All are fitted to meet the special conditions in either field.

It is not the purpose of this paper to go into the subject of wherein these plates differ, as this can be worked out by the reader, in conjunction with the various demonstrators of the manufacturers' products.

Let that reader who may not have given much thought to the color values, as represented by the flesh tints of his subjects, as well as the drapery, backgrounds, etc., used in arrangement of his compositions, place his assistant in position for a picture under the ordinary portrait light. Let him view the subject from a little to one side, so that the narrow shadow side will be of proper strength, clearness, and depth. Suspend from a head-rest, a pure white card-board on the light side of the face, on a line parallel with the ears of the sitter, so that it will receive exactly the same light at the same time without throwing any shadow or reflecting any light. A few inches away from the head is sufficient.

At a few feet distant, note the effect of the color on the face, contrasted with that of the card-board. It will be noted that the general color of the face is yellow, gray, florid, etc., to a greater or less extent, and that it is in some instances blended with a tint of pink, red, or shades of brown; while various parts of the face—lips, nostrils, cheeks, under the eyes, by the mouth, nose, and on the forehead—will tend either to other colors or verge into various deeper tones of the general local color of the complexion.

This general color scheme of our subjects of course varies greatly with different people, not even excepting children.

The contrast between the face and the white card-board is very marked, and the most skeptical reader must admit that the making of pictures of our subjects in which the faces and hands are represented by *white paper or values akin to it is all wrong.* It should not be countenanced in our work.

The pictorialist will, in his working light, expose, develop, and print his negative so that the color values of his model and the depth or richness of the composition will show in his print—*i. e., in some degree of relatively dark tones, of black or sepia as the case may be.*

As this class of our co-workers are more or less *insistent* upon carrying out their views, they naturally appeal for patronage to that class possessed of sympathy with their methods. Among this class of artists of the lens there are some who carry their views of color, tone, breadth, atmosphere, etc., to such an extent that their productions have caused a revulsion on the part of some of our better professionals, who are otherwise very indulgently inclined toward pictorial work, and who, while they are themselves working to some extent along similar lines, are now doing so with their hands outstretched to check a too rapid stride, for fear they may be dashed to pieces in the end.

The writer is not unwilling, as the reader will perceive, that someone else shall set the pace for radical departures from conventional customs. He believes, however, that some such departure will be healthful, inasmuch as a clear understanding of that which is best to be retained or rejected along these lines cannot but eventually prove a benefit to our art.

History is full of examples of the work of the extremists in all fields. That this work sifts itself out, and in the course of time reaches more nearly a middle ground, is well known.

The ultra school in our art will have made its bid for favor, and will have done its share toward our advancement. It will have presented its claims for recognition. In due time judgment will have been rendered, and wisely so at that.

Now, as to obtaining color values in face, neck, hands, hair, drapery, etc. We will put it to a common-sense test. We will take it for granted that many of our readers who have not done so in the past, will, if they are really desirous of improvement, adopt it in the future. With this understanding, we will proceed.

The general or local color of the subject may be gray, slightly yellow, or it may appear that the tendency is toward a delicate tint of pink, etc. Don't then strive to produce a deep tone in the final print—in other words, have the negative such that it will give a strength of color commensurate with your impression of the original. Place the sitter under the light, therefore, with due regard to location in view of the result desired.

If in too strong a light, different planes of the face catch an undue quantity of light, and are accented in consequence, the lights on these places will be out of value with the rest. This result will follow whether the subject is of fair, medium, or dark complexion. All subjects *must be far enough away* from light to prevent these accents being reproduced *in undue proportion*, if values are to be preserved. Only that quality of light necessary to modeling should be used. The distance of the sitter from the light—beyond that necessary to prevent undue accents and the strength of the softened light that falls upon the model, denotes what, with proper exposure and development, will be the ultimate tone or depth of dark in the finished print. It gives you the low or very low-toned effect; thus, other conditions being equal, influencing the character of your negative.

If, when the subject is placed in position, the protuberances of the face are unduly accented, pull the chair or platform away, a little at a time, till these places receive their proper amount of light. If the room is large enough the size of the light makes no difference. If the room is narrow, cut down the size of the light till you get it right to suit the width of the room. Don't try to obtain the result by working close to a small light, which if strong is brilliant, and if small lacks in general illumination. The result in consequence is black shadows, glass for backgrounds, accented lights, etc. This is *not* what is wanted, but a mistake that has been made for years by many workers.

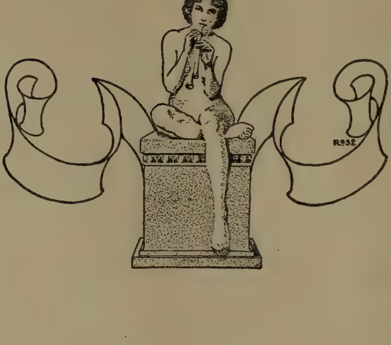
An open skylight as large as possible, a subject away from the light, *no* reflectors except the properly toned wall of the room, or at most a medium-painted gray ground some considerable distance away, constitute the conditions under which this work is produced. This ground will preserve the shadow of the face, rendering the shadow eye as perfect in reproduction as the other.

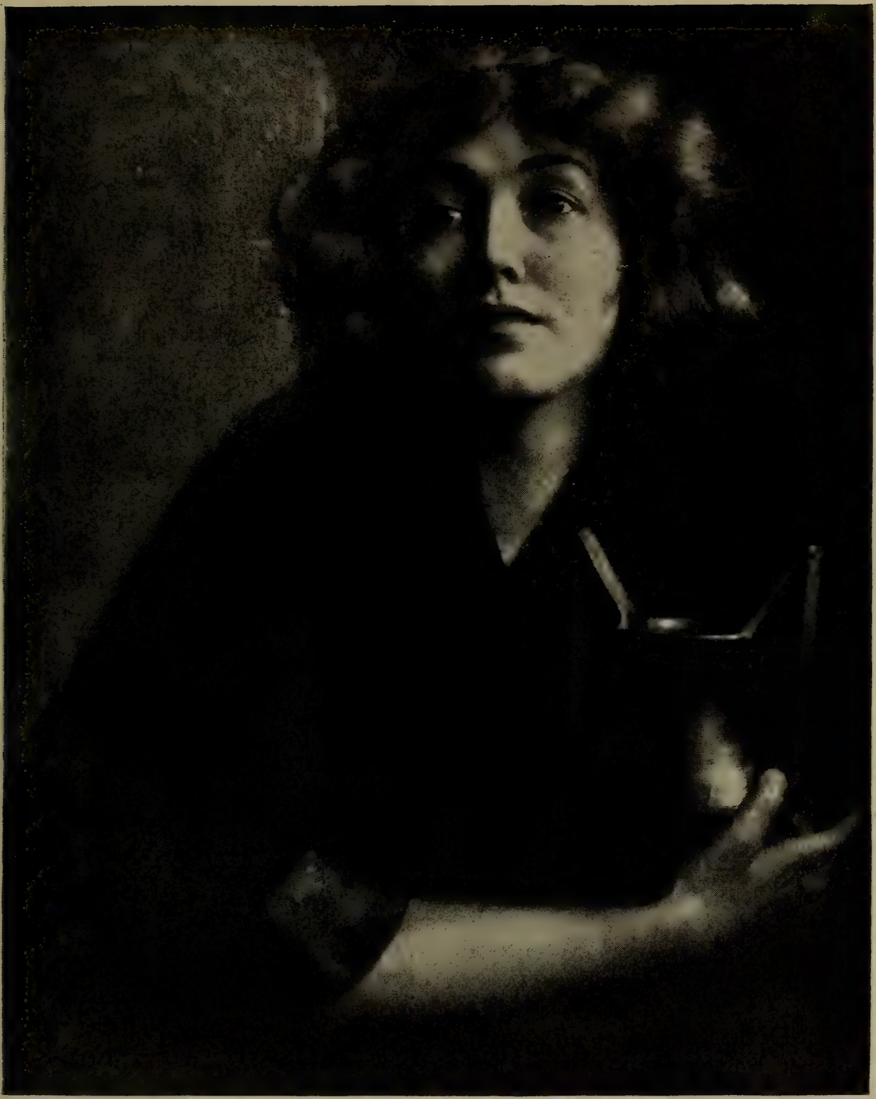
Pictures on these lines may be made in *all lights*, by simply selecting the proper location for the sitter. Some of the most beautiful effects are possible with the subjects directly facing the light, where detail is shown under the eyebrows, as on the cheeks. The subject may be posed in corners of the room, or even two or three feet from the skylight side of the room, *if well back of the light.* All that is required is an appreciation of what is needed in the resultant negative. The above remarks are not necessary for the guidance of the expert operator, whose ability is such that he can produce pictures where many would not think it possible. Recognition of the following points will serve as a guide for those who may lack experience in producing pictures that possess color values and tone. These are:

1st. Keep your subjects away from and not under the open skylight. Allow no direct light to fall from overhead, accenting too strongly the prominent parts of the face.

2d. If the subject is placed directly facing the light, don't let the strongest point of this light come from a point below the head. An angle of from 35° to 50° is better. If too low the value of the eyes will suffer. Give full exposure to your negative, use large stops, and develop so that when dry the negatives will yield prints where the high lights are all tinted, the degree of tint there imparted determining the high, medium, or low-tone character of the negative.

Have the light that comes into the skylight room *pure as possible in actinism.* Keep the skylight glass and white curtains, if used, clean, so that the light that enters is pure. Its diffusing qualities will round up the shadows and assist in producing the values of the drapery. If the skylight and curtains are dirty, the purity of the light is impaired to an enormous extent and the whites only are photographed with blank results. Their values are lost, and the drapery especially, if dark, is entirely wrong. Try clean skylights and curtains for six months as an experiment and see the improvement.





BY JANE REECE
DAYTON, OHIO

SOFT-FOCUS LENSES—THEIR USE AND ABUSE

By FLAMBEAU

SOFT-FOCUS lenses are becoming constantly more popular, especially in America. This is because they show superior pictorial results compared with those produced by an anastigmat. They have been too long in securing recognition by the many; and some photographers still fail to see any advantage to be derived from their use. This is owing to misunderstanding concerning them. Through misconception of the requirements of modern art, and the true functions of these objectives, they have been greatly abused, as well as misused, even in the hands of some of their advocates.

To use the soft-focus lens effectively one must know thoroughly their distinctive attributes; also what one desires, or should desire, to do with them.

Attributes

Many—perhaps most—photographers believe that the only special quality possessed by these lenses is that of diffusion. This has been published from time to time as a fact. Now, diffusion is perhaps the least desirable of its several distinguishing merits—that being only one means to an end. The advantages of these instruments for artistic effects are:

First, in enabling a worker to operate synthetically—to render his subject in masses instead of details; just as other lenses will permit him to depict his themes analytically—with facts distinctly and profusely expressed and objects identified. By employing a soft-focus lens, the photographer can now interpret nature in monochrome with breadth of effect just as well as a painter can do it, and more easily.

Second, with such lenses true differentiation of planes can be had consistently, which is not the case with a fully corrected lens.

Third, these soft-focus objectives render light better than any other type of lens can do it. I am aware that, in some hands, light has been depicted by these instruments such as was never seen on sea or land; for example, as snow-balls of halo shown among the foliage of trees and elsewhere. But that was because the photographer did not know how to use the lens, or else the one employed was improperly constructed. Lenses of the type are now made that exhibit no halo, flare, etc., at an opening of *f*/5. With such a lens, in competent hands, light in its varied aspects—even fleeting effects—can be secured and presented truthfully and in a manner greatly superior to a fully corrected lens.

Fourth, as moods can only be interpreted by means of light correctly rendered, the soft-focus lens, surpassing all others in depicting light, is paramount for representing moods.

Fifth, such art qualities as suggestion, mystery, breadth, etc., can only be successfully produced by a soft-focus lens; for an anastigmat, for example, cannot suggest, it must identify; and it is too matter-of-fact for mystery, etc.

Sixth, delicacy and tone, qualities of utmost importance ofttimes, are secured, as far as the lens is involved, better with the soft-focus than with any other, in my opinion.

Seventh, I think it was Constable who said, "Rocks, trees, mountains, plains and waters are the features of landscape; but its expression comes from above; and it is scarcely metaphorical to say, Nature smiles or weeps, and is tranquil, sad, or disturbed with rage, as the atmosphere affects her." Now, it is almost impossible to secure true atmosphere consistently with a fully corrected lens; but a soft focus instrument renders it easily and truthfully. The "lost edge" of the latter contributes greatly to this. Therefore, I have found that lens superior for atmospheric expression.

All this is far from showing diffusion to be the sole benefit to be derived from employing a semi-corrected lens.

How to Use

In using a soft-focus lens one has to know what one wants. If art principles are unknown, or but little known, to employ it will result in failure in pictorial work. Only if one knows, and to the extent one knows, can success be achieved. Of all the disgusting works of alleged art that are produced, hung or published, those made with soft-focus lenses rank the rankest, if not the result of knowledge and skill. The cause is to be found in the ignorance of the photographer, not in the lens; although a particular instrument and its manufacture may be to blame in certain cases.

What is required by the dictates of modern art? This demands an impression or illusion of Nature. "Art has nothing to do with things as they are, but only with things as they *appear* to be; with the *visual*, not the *actual;* with *impressions* not with *realities.*"[1] The man who renders facts as facts is a scientist, not an artist; for science gives us "the truth, the whole truth and nothing but the truth." Art sets forth what the artist sees, from where he sees it, although he may know it is really different. He will represent the successive planes as he sees them and the objects in each plane just as they appear to him and in no other way. It is a matter of distance and standpoint.

All this is what a pictorial photographer should do, and can do, with a soft-focus lens. He cannot do it with any other, or not so well; but with a semi-corrected lens, when one knows how, it can be done in a manner true to the visual in Nature, art and experience.

Because this is not adhered to, most users of soft-focus lenses fail, especially in portraiture. For the subject of a portrait is always nearby and, consequently, seen clearly, and modern art requires things observed distinctly to be so rendered. Instead of this, most portraits made with semi-achromatic lenses are either vague, flat or are smudges, with little modelling or none; one eye knocked out, or both; half the face as black as ink, the other shapeless and chalky from halo. Many persons are depicted as they should be if they were in the middle-distance or distance. Some pictorialists of reputation perpetrate such things. And they seem to be proud of it, for they flash their names from them. In the future these "works of art" will not be regarded as great ornaments when hanging from family trees!

To Focus

One should focus with a semi-achromatic lens to get just what one wants. With an anastigmat one would focus to obtain every thing as sharp and detailed as possible; for the chief function of that instrument is sharpness. With the other, one should focus for the opposite—for effect; to mass; for breadth; to suggest;—foreground clear, the principal object or plane softly emphasized; middle-distance only slightly defined, and the distance indistinct and lightened, etc. This will simplify the scene and make objects and things so unobtrusive that the character, spirit, sentiment or mood will arrest and impress, the motive that attracted the artist will be passed on and felt by the beholder of the picture, and realities will not divert from the deeper meaning. In focussing a portrait get the features clear and full of expression, even when it may be desirable to simplify the clothing. Thus, one focusses, not for one thing only, but for many—for all one sees or experiences. In some cases, if one focusses the distance so that it seems right, the rest of the view will automatically assume its natural and desired aspect. But bear in mind that one cannot get sharpness with a soft-focus lens; that it is useless to try; and the lens should not be condemned because one cannot. If one could it would not be a soft-focus lens.

Enlarging

What has preceded supposes that a soft-focus lens is to be used to work with direct. Some take their pictures with a fully-corrected lens and enlarge with a semi-achromatic objective. This procedure will show a great improvement, as far as softness is concerned; but it will not give all one might secure, in the case of landscapes, by the other way about. When a negative is made one must take and be satisfied with what it contains, unless one wants to resort to "faking." It cannot be altered much without getting something entirely different, be it better or worse. I have seen it published several times that, to get the full benefit of soft-focus quality by enlarging as indicated above, one should make a positive and from that a new negative with a soft-focus lens, then make the enlargement. What is the use of going to a lot of unnecessary trouble, of wasting plates and time, of often making mistakes to be rectified and, finally, fail to secure much that is desirable, when, if one has a soft-focus lens to enlarge with, or make a negative from a positive, one can take it out and get the negative with it direct and proceed in the usual way? If the subject is taken with a soft-focus lens it can be enlarged with a fully-corrected lens, if desired, and nothing important be lost or changed. But it seems to me if one is going to use a soft-focus lens that one should do it throughout, or drop it—no partnership is needed or desirable. There is no necessity of one bringing in the anastigmat in the first stages at all.

---

[1] Birge Harrison in *Landscape Painting.*

The above refers to landscapes, for various reasons, some of which appear in the preceding paragraphs. A portrait, I think, in most instances, is better made with an anastigmat and enlarged or printed by projection through a soft-focus lens; as in such cases no planes sentiment, moods, etc., in the same sense as in a landscape, are affected and only softening of outlines, massing, etc., are needed to be introduced. Some skilful workers, like Garo, succeed direct; but there are few Garos, and the way I have suggested will best serve the vast majority, judging from their results.

Control

Many believe that those who work in oil, bromoil, gum, etc., would best employ an anastigmat and resort to after-treatment in those media. The soft-focus lens is for those who desire to do straight or direct artistic photography, with but little or no control or after-manipulation. It is likely there never would have been any control processes if photographers had had earlier an objective with which they could have obtained artistic effects. As soon as pictorialists learned what was needed for artistic expression, they found it could not be secured direct with the instruments they had, so they were obliged to resort to control and manipulation to supply the deficiency. Much beautiful work has resulted. The soft-focus lens now meets the requirements,and many do not see the need longer of control. Where the worker in pigments softens his outlines and broadens his effects with brushes, etc., the other does the same thing with his soft-focus lens; where the former obtains suggestion, mystery, etc., by hand-work or manipulation, the latter gets it by focussing; where one puts in clouds or gradates the skies by brushwork, the other uses a graduated filter and obtains clouds or graduation in his negative along with the landscape. The latter stands the better chance, in my opinion, of getting and passing on the impression that attracted, and of being more true to Nature; the former may have to (and often does) offer a result he never saw and can never duplicate. I am not advocating either method in preference to the other, only trying to show what can be done with a soft-focus lens. There are many workers, however, who employ a soft-focus lens to get their pictures and use control methods to complete them.

Advice

Discard the idea that all it is necessary to do in order to become a photographic artist is to get a soft-focus lens and take pictures as blurry and indistinct as possible. "Mush" is not impressionism; mystery is not obscurity and disintegration; suggestion suggests something; invariable vagueness (except in nocturnes, etc.) awakens the suspicion that the one who perpetrates it is either possessed of defective vision or is—queer! When a scene, object, or effect is clear, do not mar it by indistinctness; when these appear indefinite, do not alter by rendering them plainly. Give your own impressions or the emotions you experience, the best you know how. The result may not be appreciated by some, but others will value it; and you will have one satisfaction, at least—to know that you express your own idea and not that of someone else.

Again, be very careful what soft-focus lens you buy. There are those designed to be of this type and advertised which are not, in the true sense. Others that are manufactured may be good or not, and you are just as likely to get a poor one as any other. There does not seem to be any uniformity in the production of some of them. Therefore, every intending purchaser should make careful investigation, and not conclude hastily that one is as good as another, as is usually the case with anastigmats. I know of but one or two firms whose objectives of the type referred to are in any degree invariably excellent.

Finally, do not believe all the claims made in advertisements. Opticians have to make soft-focus lenses to meet the demands, and as this is mostly for fast-working instruments they must offer such or be regarded as behind the times. Recently a professional photographer showed me one of these lenses he had had made specially, sixteen inches focal length, working at *f*/3! I saw what he got with it—just what might have been expected. Now, an optician knows that, in the case of a soft-focus lens, he cannot make one that works better than *f*/8 in the longer focal lengths, or at *f*/6 in the shorter, without sacrificing one quality to gain another. If you crave, and obtain, larger apertures you are courting trouble and will get it, in many cases. With modern rapid plates, *f*/8 is fast enough for most purposes and will give excellent results. It is faster than *f*/8 used to be with the old lenses and they answered very well, and many are still using them. If you get a soft-focus lens that really does good work at greater openings, so much the better. If not, and you want more speed, instead of getting it by larger stops, I would advise you to put more light into your studio or, if it is required outdoors, give *time* exposures instead of snaps. With a soft-focus lens it is *quality* that counts, not speed.

DREAM, MAN, DREAM!

"WHERE there is no vision, the people perish!" The seeker after homely truths in the Bible does not lay it down unsatisfied. We have one in the quotation. And it is a truth.

The man who starts out in business without a vision of what that business is to be, doesn't get very far. He has no imagination, nothing to look forward to. He opens his door in the morning, waits on those people who come to him for what they need and closes the door at night, no nearer the goal toward which he should be working than he was the week before.

Some of the old practical fellows will tell us that imagination has no place in business. They tell us that imagination runs away with business men. But look about you at successful men. Where would they be without having carried with them throughout their business lives successive visions of their businesses of the future?

Worship at the shrine of vision and work out those details that will make of your visions realities. Determine what your business should be, what it can be in your own community, and then work, work, work.

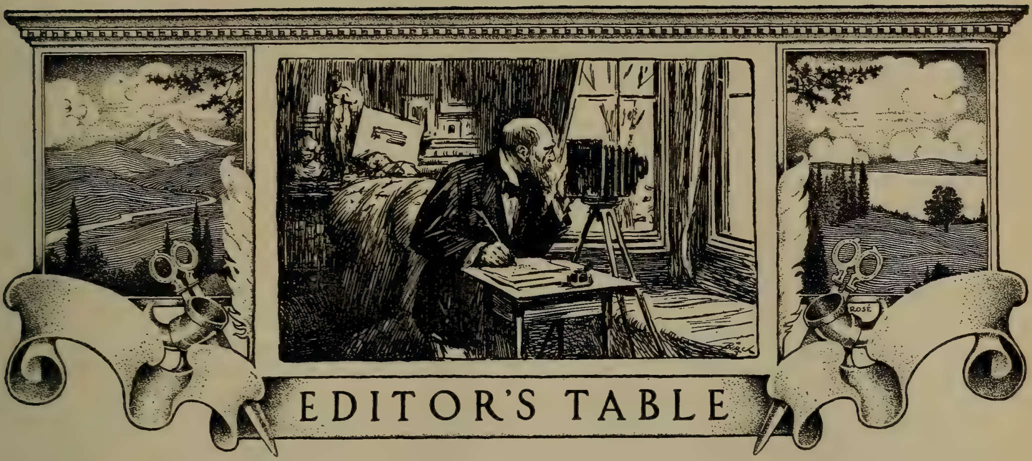
Learn all you can of your competitors. They have some weak spots. And those weak spots will make way for your entering wedge.

Vision alone is helpless, worthless. Work alone will bring to pass those things which vision tells us are just beyond, just over the top of the hill. Climbing the business hill is no snap, but climbing would have nothing before it if one had no vision of what the climb was for, of what the top of the hill would disclose.—*The Couchmaker.*

EXPRESSION AND LIKENESS

On what does likeness depend? It seems a simple question, but it is one which cannot be answered easily off-hand. Likeness is associated with detail of feature; but this is not a sufficient definition, for we can recognize our friends a block away when not a single feature can be defined. Perhaps likeness lies in the masses of light and shade; but these vary according to the light, or the hat worn, or a score of other variable quantities. It can scarcely be considered as lying in outline, for little of unvarying or distinctive outline is seen except in profile and we do not see much of our friends by profile. At least it may be considered that likeness at close range depends more on the surfaces than on the outlines of the face. Doubtless the eye is familiar with every detail of feature, every mark, and is equally conversant with every characteristic pose or gesture, and with every appearance of masses of light and shade on the face when at a distance. The eye sees a figure at a distance, and at once recognizes it, without knowing why. It may be a peculiarity of walk or poise of the head. That is all that can be seen at a distance, but for the rest. it is known to the mind of the one who sees, and that is sufficient. A figure is known to a certain extent by its motions; for many persons, especially men, have some peculiarity of gait. But to endeavor to reproduce this peculiarity would in photography lead to disaster; caricature is best able to portray it, and that is a province that professional photography has no wish to enter, though it may occasionally unwittingly stray in that direction. "Arrested motion," as it is termed, is the rock on which such attempts come to grief. But if the suggestions of motion in a figure be beyond the scope of professional photography there is yet left to us the equally characteristic attitude of repose; every man—every woman—has a characteristic attitude, and in that attitude there is one chief and dominating factor. It may be some beautiful pose of the hands or the placing of the arms. It may be a frown, or a craning forward of the neck, or any one of a score of things. In any full length the appreciation of a characteristic attitude goes far toward succcss.

The photographer very naturally, and inevitably, makes the portrayal of the face his chief business; but probably a mistake has been made in too much of exclusiveness in this direction. The obtaining of a more comprehensive likeness, as opposed to mere detail of feature, is a class of work with possibilities; and is a class apart from the mere pictorial rendition of three-quarter or full lengths. This latter is very beautiful, and has both a commercial and an esthetic value; nor can it be said that we see too much of it. But there is equal room for rendering in which the merely pictorial yields in part to character. This character-likeness is indeed to the figure what expression is to the features, and it is to be obtained in the same way. Without expression, the features, however beautiful or however correctly photographed, are a mask rather than a soul. With it we obtain the life and charm of the true portrait. Expression can seldom be conjured up by the sitter; it must come naturally and spontaneously and without consciousness. There is an art of taking beautiful photographs, which from their beauty are pleasing to all who do not know the originals, and which are considered as likenesses because they are recognizable. There is also an art of obtaining a true likeness—and one not incompatible with beauty or pictorial quality—through a correct rendering of attitude and expression. And this latter is not cultivated as much as, with profit, it might be.



"BETTER BUSINESS"

ONE of the most interesting and promising signs of the times, from the viewpoint of a professional photographer, is only beginning to make itself apparent. The sign of promise is to be read in all parts of the country in the increased attention that is being given to the development of what may be termed the purely business end of the photographic problem.

The National and State associations are devoting space in their programs and time in conventions to its exploitation and discussion. The several photographic journals throughout the country have devoted considerable space to this subject, and it is more and more claiming and holding the individual attention of the progressive professional.

It is now coming to be very generally conceded that most of us are long on the artistic and short on the business side of photography. As the situation is becoming clear, and photographers are realizing, as they never have done before, that they must adopt modern methods of business in their studio and conduct their work on the same lines that alone make other business profitable, the outlook of the professional photographer improves.

The past few years of the war-period, with the culminating aftermath, have brought us face to face with economic conditions which must be confronted and solved. While it is a time for hard, plain thinking and practical management, the photographer who has his house in order need not fear. It is wise to be conservative, but this does not mean contraction. On the contrary, in order to meet these many problems, he must *expand*, and there is every reason and prospect that business in and out of the studio this fall and winter will yield profitable results to the photographer who has his business on a sound basis.

In waking up and reaching out after more business he consciously expands in every direction. The adoption of a more progressive policy in one part of his establishment leads to improvements in the other lines, until almost before he knows it he is producing work of a better technical, more artistic, and more salable quality.

The discussion and adoption of modern business methods in the photographic studio is one of the most promising signs of the future in the photographic craft.

ON HAVING A METHOD

OF the many causes to which failure in business is ascribed, want of method is the last thing that would be admitted, though more often than not the real reason of ill-success. We hear often enough of such explanations from bankrupts themselves as "want of money," "want of opportunity," "bad luck," "bad debts," etc., but if the official receiver could be induced to state the causes of the majority of failures which come under his notice he would say "want of prudence," "want of tact," "want of knowledge," "want of purpose," and above all things, "want of method."

Yes write it up large: WANT OF METHOD; the true cause of half the failures in life. It has broken up homes, destroyed life's prospects, blighted ambitions, wrecked businesses, and broken men down in the heyday of life with worry, anxiety, and sorrow. It has sent men to work-houses, lunatic asylums, and prisons—aye, and filled many a grave. Yet men will go on trying to do business without method, heedless of the lessons they should learn by the sad experience of others, and blind to the teaching of their own bitter experience when trying to run a business in which method is either inadequate or totally absent. Day by day they are worried by troubles arising from their own errors, or the mistakes of their employees, or harassed by inability to get business done to time, or to make ends meet, and yet they cannot or will not see that the remedy is in their own hands. They blame employees when they should blame themselves. If employees are left to do as they please, it is foolish to blame them if they go wrong.

Let every business man ask himself, when a mistake occurs, whether he could not have done something himself to have prevented it, either by giving his employees proper instructions, or by devising a system of checking one man's work against another's which would prevent the possibility of such an error.

It has been well said that the employer should be captain of his ship, and his presence be equally necessary to its safety. Even in very large concerns which may be correctly described as a series of small concerns worked under one management, the employer should generally superintend, and by his books be generally cognizant of the principal details of his establishment.

We too often hear the heads of businesses say: "How can I find time to see after every little detail? I cannot be on the spot always. I have to trust my employees, and the will go wrong sometimes." True, but how often may an error be averted by constant anticipation, watchfulness and organization. To our mind, an employer who excuses himself to a customer by laying the blame on his employees, accuses himself of weakness, if not incompetence. Never let your customer know or feel that you mistrust your men, or that you have no confidence in some particular department. It implies at once a weak organization. Take the blame on the shoulders of the business as a whole, set the matter right with the customer without entering into long explanations as to what this or that man or department ought to have done, and when you have finished with your customer, review the causes which led to the mistake, delay, or trouble, whatever it may have been; but before anything else, sit down in your own private office and review yourself and reckon your own responsibility. Don't haul the offending employee onto the carpet and lose your temper in abusing him. Just quietly talk the matter over with yourself. Try to kick yourself, mentally, for having a business in which a mistake was possible. Wasn't there something you might have done to avoid it? Isn't there a want of method about your business? Isn't your correspondence loosely conducted, and are not your letters badly filed, your books badly kept, your orders loosely given, your shop untidy, and your men allowed to become slovenly and unpunctual in their habits? Depend upon it, there's a screw loose somewhere.

Men are very much what their masters make them; their habits, as a rule, reflect the style of business as a whole. In well-managed businesses will invariably be seen bright, intelligent, tidy-looking men, whose every action shows their briskness and smartness. Every man has his place, and every man is in his place. There may not be an air of hurry-scurry and bustle; it is rather like looking at some intricate piece of machinery, some parts of which go slowly, some more quickly, and some with great speed, but each moving in its appointed way at its given rate, and the whole uniting to turn out something perfected and finished from the raw materials which were put in. There is a master hand and master brain to start, stop, or guide the machine, and if he does his part aright the mechanism does its appointed work.

"Method," says one writer, "digests the matter that industry collects; it is a habit of saving time to all, and without which no business of any size could be carried on. It apportions time to duties; never trusts to memory. Diaries and indexed books are cheap and invaluable. Arrangement keeps, by means of books, an exact registry of every transaction; it has a post for every man, knows what every man does, a place for every tool, a pigeonhole for every paper; it keeps all books posted up, by which you are cognizant of what you are doing and have to do, enabling you to send out your accounts to time and make your collections promptly."

If men who are in the position of employers or managers would only study Nature a little, they would see what splendid lessons she teaches us, how everything in the universe has a place "where, though all things differ, all agree." But there are so many men in positions of responsibility who go through life seeing without learning. That is the reason why great success in life only comes to the very few, and they are invariably men of methods.

DISCONTENT

FROM healthy discontent comes progress. If no one had been discontented with the log canoe we should never have had the *Olympic* or the *Imperator*.

But discontent which is not controlled and directed by good sense destroys the happiness of its victim without bringing him betterment. It prevents him from enjoying what he has without getting him anything better.

No king, aristocrat or billionaire was ever known to be satisfied with his lot. Every man or woman, however fortunate he or she may seem to others, looks upon some other man or woman as more fortunate.

These are platitudes, and yet there are, we think, more than the usual number of people at this time who would be better for remembering and pondering them. The discontent that is apparent in our mood today is in a large degree a foolish discontent, not justified by actual conditions and not corrected by common sense. The radicalism which prevails in some quarters is the result of ignorance and of harsh conditions. It has a justification, even though it is not wise in its efforts at advancement. But there is also a great deal of radicalism that cannot be justified in any sensible consideration of the conditions of life. America has come through the ordeal of a world war with comparatively little sacrifice. There is work for everyone, and good pay for work done, even for work badly done. There is a great outcry against the high cost of living, but spending is more lavish and heedless than usual.

A good dose of the salts of common sense would dispose of the discontent in the United States. Hard times might also work a considerable cure.

The political, economic and social conditions of American life are sound. The agencies of human progress are powerful and in the hands of the people. There is no perfect government, there are no perfect conditions anywhere, and there never will be till men and women themselves are perfect. Most American discontent is the result of ignoring these truths and the good things we possess.—*Home Spun Yarns.*

PRACTICAL PAPERS ON STUDIO WORK AND METHODS

The Photographer's Assistant

THE masters plead inefficiency as excuse for low wages, and bewail the lack of good assistants. The assistant pleads lack of means and absence of encouragement as excuse for inefficiency. Which is right?

The position of assistant in the average photographic business has been in the past anything but an enviable one from any point of view. He is expected to handle successfully a large range of materials which are sensitive to many influences, often in circumstances and with apparatus that are in themselves handicaps to the production of good work. The knowledge and skill required to cope with the never ceasing stream of technical problems are perhaps greater than in any other craft, not only because of the existence of those problems, but also because the photographic business is not so sharply subdivided into its many branches, and an assistant may be called upon at any time to do work of a kind quite outside his ordinary job, and is expected to produce results equal to those of a man whose regular practice it is.

That roughly suggests what is expected of the assistant as regards his work. Usually he is required also to keep an appearance above that of a wage-earner, such as a mill-hand, letterpress printer, or bricklayer, and to cultivate the affability of speech and manner which is perhaps the principal asset of the successful doctor or lawyer. The dark-rooms in which many assistants spend nearly a third of their lives and most of the hours of daylight often are little better as regards health or comfort than the workrooms of many years ago described so vividly by Charles Kingsley in *Alton Locke*.

So that compared with other crafts, quite apart from the rate of wage, photography exacts more, and offers less. That the average rate of pay, and consequently the social position, of the photographer's assistant, is comparatively very low is a fact, obvious and admitted. What are the natural consequences of this?

I think that assistants may be divided broadly into two classes. The first class has caught the fascination which undoubtedly exists in photography for anyone with average intelligence and a little imagination. If to these qualities the assistant adds ambition he usually becomes the master-man eventually, but the business knowledge essential to success is not easily gained during the assistant period. The second class, by far the larger one, and probably still more increased by war recruits to the business, comprises those who are by nature slack, unintelligent, or unambitious, and those for whom the handicaps and discouragements incidental to the struggle for success in such an exacting calling have proved too great.

The worker who has struggled to efficiency in spite of the many difficulties in his path still finds that adequate reward is not easy to get. He may have worked for a low wage for the chance of getting special experience, but the last rate of pay earned is still too often taken as the measure of a man's value. Many employers, far too many, are imbued with the idea that if they only advertise and sack, advertise and sack, often enough they will eventually secure for the inefficient's wage either one of the skilled men willing to work for little money to increase his experience, or one of the disappointed ones for still less. The result is that the latter either recover a bit of their ambition or sink entirely to the level of the man who only does just enough, and that hardly well enough, to earn his salt. The ambitious man very quickly picks up what he wants to learn and moves on, so that this type of employer is seldom suited for long. Another type of employer has greatly increased of late years in the shape of the "company shops," who turn out large quantities of inferior work by semi-skilled workpeople on the "factory" principle. The wages offered by these firms to inefficients are often much higher than those paid by firms of standing to expert assistants.

I have tried to show that the conditions fostered by employers tend to discourage a man from becoming efficient, besides offering him little reward if he overcomes the difficulties, often needless and stupid, placed in the way of his improving his ability. That there is "plenty of room at the top" is not true of photography, for there are always vacancies for those willing to accept a low wage; but a man who has made a study of his business and knows his real ability is often turned down in favor of one who will work for a little less money. It does not seem to occur to the average employer that the careful and conscientious worker can easily save the extra pay he asks, both in time and material as well as in quality of output. Yet we find the employers continually bewailing the difficulty of finding efficient assistants!

Make the life of a really good asssitant worth living, by giving him tools and material that will be a pleasure to work with, in clean and healthy workrooms, and pay him a wage that will permit him to have a decent home that he can take a pride in, as well as to have a hobby or two and the time to enjoy them in, and there will very soon be an army of assistants making themselves efficient. A few employers have realized this, and find it pays them well to pay their staff well.

This new feeling of self-reliance and impatience with injustice, if it can show itself so strongly in the most autocratic institution we have, is not likely to be shed when the khaki is left behind.—D. Charles in *B. J.*

Technic

Unlike his amateur brother the average professional photographer pays very little attention to the more advanced technic of photography. He is for the most part content if he can produce pictures of quite ordinary quality and concerns himself little with the more modern developments of photography. On the other hand, the amateur who takes his photography seriously, and who figures successfully at the leading photographic exhibitions throughout the country, is constantly studying the technic of photography, with a view to improving his own work—a course amply repaid by its results. This type of amateur photographer has at his fingers' ends the advantages offered by the various kinds of plates. Printing mediums are fully understood, while he is thoroughly familiar with the more recent advances along the line of color photography. This is merely mentioned by way of pointing out that when work of a more difficult nature than usual is being undertaken the advanced amateur can generally do it successfully, which cannot always be said of the average photographer who takes pictures for a living. We advise all engaged on professional photography, no matter what branch, not to overlook the study of technic, which may be beyond present needs. Such knowledge is never amiss, and is sure to be reflected in the production of finer work. Even great artists in the past have suffered through a lack of technical knowledge, though their execution may itself have been faultless. At least two, whose work has come down to us from generations through lack of technical knowledge, used fugitive colors which have robbed their work of some of its finest qualities. The moral for photographers is obvious.—*B. J.*

The Choice of the Mount

The modern portrait photographer is faced with a problem of which his predecessor of a score of years ago knew nothing. When practically all prints were made upon albumenized paper and were mounted with a margin about an eighth of an inch wide, it did not matter very much what the color or the surface was. Added to this the fact that there was little choice, the range being practically limited to cream, maroon, green, and black, little scope was left for the exercise of individual taste. Platinum prints were treated to a white mount with a wide margin under the impression that they then resembled engravings, but few other prints appeared on anything but the orthodox "gilt bevel" card.

With the arrival of the bromide print there was a great increase in the number of styles offered to photographers, and a catalogue of mounts became quite a bulky volume. These also are things of the past, and we have reverted to more simple mountings, which give the artistic worker an opportunity of giving his pictures an appropriate setting. It is, however, not yet fully understood to what extent the effect of the finished production may be made or marred by the color and depth of the mount. Many photographers adopt a uniform color for all their work, thereby losing a valuable opportunity of compensating for errors or variations in color and contrast.

As the choice of a mount is largely a matter of taste it is impossible to give any definite rules, but there are certain points which may be indicated which will, perhaps, be of service to those who have not given much thought to the subject. Thus, if a print be rather flat or lacking in contrast strong contrasts should be avoided in the surroundings, a delicate gray picture calling for a mounting paper of a correspondingly light tint, not, as is sometimes seen, one with a pronounced black tint upon a white or very pale gray paper. It is a safe rule to make the immediate margin round the print darker than the highest lights and lighter than the deepest shadows of the picture, but there is an exception even to this, for in the case of a chalky black and white print a black "tint" and a light cream or white mount will, by contrast, give a softer effect.

In the case of rusty black prints the color will be improved by selecting a brown mount which, again by contrast, makes the black colder in tone; a cold gray, on the other hand, emphasizes the rustiness. Sepia-toned prints vary in color, even in the best-regulated studios, and should be made the best of by judicious treatment. As a rule, those inclined to be "foxy" show better upon gray than upon brown papers. Rich browns look well upon cream or gray; browns near the color of the shadows should be avoided, as the latter are apt to merge into the mount to the detriment of the composition. It is in this respect that a narrow tint round the print will be found useful, as it serves, too, as a separation between two nearly similar colors. Some photographers, especially ladies, use a ragged piece of imitation Japanese paper as a tint, but this is hardly commendable when a stout paper is used for the print.

The surface of the mounting paper should receive due consideration, and generally uneven surfaces and "linen grains" should be avoided when no tint is used, as the inequality of the surface often shows upon the print. If such papers have to be used it is better to interpose a smooth surfaced tint, to prevent this occurring.

Dry mounting is now so generally used that it is hardly worth considering the older method. If, however, any other adhesive has to be employed, there is nothing better for flexible mounts than fish glue applied round the edges of the print only. If a piece of zinc, or even card, a quarter of an inch smaller all round than the print, is laid upon it, the thick glue is readily run round with a stiff brush, and if the paper is fairly thick there will be no sign of cockling.

If the prints are enclosed in folders these should match the mounts as nearly as possible, with, perhaps, an exception in the case of white mounts, which may be enclosed in brown or gray covers, whichever may be best suited to the print. As a rule, embossed emblems on the front of a folder give a cheap effect, although the monogram of the photographer is not amiss here.—*B. J.*

Concealing the Effort in Photography

At a vaudeville show we all enjoy watching a graceful dancer, a dexterous juggler, a clever magician, a finished musician, or even an acrobat; but we derive pleasure from their acts only if they are original, artistic and perform with ease. We would soon tire of a violinist, for instance, if he struggled with his instrument, showed undue exertion with the difficult parts, or allowed us at any time to realize that the selection he was playing was an effort for him.

Art is no longer art when we see the effort. Art conceals art. The artist must not reveal the mechanics and construction of the work.

Now all of this applies to professional photography. Too often the photograph not only shows the discomfiture suffered by the subject, but also the critical public is made to feel the efforts of the photographer, and so the artistic value of the photograph is diminished. The photographer should conceal the atmosphere of the gallery, the fixedness of setting and the fact that his sitter is striking an attitude.

It is a comparatively simple matter to obtain the desired results with professional models. While models have not, perhaps, the highest mentality, at least through experience they have acquired a certain amount of plasticity of pose which greatly aids the photographer in covering up his effort. The lack of pliancy in the ordinary subject can only be overcome by allowing the subject time to grow accustomed to the surroundings, to feel natural and easy. Then if the photographer watches closely he can finally determine what is a characteristic pose and natural expression.

Many people—especially men—dislike having their photographs taken by professionals, due to the fact that the results obtained are more stilted, artificial and less lifelike than the photographs of the amateur.

Only when the photographer conceals the labor of his efforts do we have true art in photography.—*Oak Leaf.*

Credit Reflects Character

Do you know that your character is judged by the way you pay your bills? Well, it is.

Prompt payment of bills tells the credit manager you are a man or woman of your word—a person of good character.

Lax payments indicate poor business methods and a disregard for the all-important business of character-building.

Promptness in meeting your obligations reflects honesty, good character and determination to maintain a sound standing in your community.

Credit men know and judge you by past performances and they have your record at their finger-tips.

To pay your bills promptly, therefore, means to keep your credit rating clear, your character rating unstained, your standing in the community unquestioned.

Good credit is an asset, a tremendous power, a thing to be highly prized and worked for. Once won, it must be zealously guarded. Each bill is a stepping-stone, so pay it promptly and lay the foundation of your credit structure surely and securely.

Pay your bills promptly—keep your credit good.

Anastigmat v. Rectilinear

Although this subject may appear to be a hackneyed one, yet certain aspects of the case that have cropped up in recent work raise points that may have not been touched on before. It seems to have been laid down almost as an axiom that the anastigmat will do everything that the R.R. will, and usually better, but that in the case of subjects that lie centrally on the plate and therefore do not call for keen definition at the margins the R.R. when slightly stopped down will give just as good a result.

These points seem so obvious that it may be useful to show that cases often arise which actually prove exactly the reverse. That is to say, that some subjects may call for the use of the rectilinear in preference to the lens of superior correction, while others cannot be satisfactorily photographed at all with the former, although they occupy only the center of the plate and require considerable stopping down.

Take for example an upright object which has detail all over the top surface as well as on its front, all of which has to be sharply defined. This calls for a rather high view-point to get the top detail, and still the back of the camera must be vertical to keep the upright lines correct. The lens, of course, is tilted as well as lowered as far as it will go, so as to include the bottom of the subject on the plate. The consequence is that the lens is often very nearly on a level with the bottom edge of the plate, and that a large proportion of the image is formed by the extreme margin of its field. That is to say, that in the case of, say, a twelve-inch lens used on a whole-plate the actual subject falls nearly all on the one half of a sixteen-inch circular field.

It is well known that very few rectilinears will give quite critical definition at the margins, even when stopped down to the limit, so that for work of this exacting nature an anastigmat is a *sine qua non*. It is not merely a question of depth of focus, which a very minute stop will usually secure, but the trouble is due to want of corrections at the margins which, in the case of an R.R. stopping down will seldom cure entirely. Every anastigmat even is not entirely perfectly suitable. We think it may be accepted as a general rule that a lens made to work at a moderate maximum aperture will prove to give better marginal definition than one of the extra rapid type. It used to be the general custom for lens makers to give details in their lists of the sizes of plates sharply covered by their lenses when stopped down, in addition to those which the open aperture is suitable for. With the craze for high speed it seems to be foregotten that in the growing field of commercial photography one is often compelled to use the very smallest aperture provided by the makers. We have two lenses which we treasure particularly, in spite of their extraordinarily heavy mounting in obsolete shutters, simply because of the uncommon diaphragms which permit of stopping down far beyond the customary limit of *f*/64, and thus enable us to get results which otherwise would be impossible.

Having shown how certain classes of work require the very best of lenses to accomplish at all satisfactorily, it remains to balance matters by demonstrating that in the particular case of small interiors the old-fashioned wide-angle symmetrical will usually beat the more expensive instrument, and this apparent paradox is rendered still more paradoxical by stating that the advantage of the R.R. is more noticeable when time or light requires the largest possible aperture. This state of affairs is explained by the fact that in interior work one is less often concerned with a flat surface for which an anastigmat is suitable than with a corner formed by two sides of a room or possibly as much as possible of three sides is required, with more or less in the way of furniture standing about, so that the subject conforms very much nearer to a hollow curve which a rectilinear will render sharply. Some of the detail is certain to fall on the line which is rendered sharp on the plate at open aperture, while comparatively little in such a subject can be arranged to fall in one plane to suit the more highly-corrected lens.

While we are upon this subject we ought not to omit a reference to the usefulness of the rapid rectilinear lenses of long focus which represented the finest work of opticians in the pre-anastigmat days. Lenses of this kind of aperture, ranging from *f*/6 to *f*/10, figure largely in the second-hand lists, and though their price has advanced substantially during the past two or three years, it is nevertheless a very great deal below that of an anastigmat of corresponding focal length. The latter certainly may have a larger aperture, but the experienced photographer knows that when he is handling a lens of focal length much above twelve or so inches a working aperture of more than *f*/8 is very little use to him. Quite apart from the suitability of the field of the R.R. for certain subjects, depth of focus of itself imposes the necessity of stopping down, often considerably below the *f*/8 stop. Thus the photographer who has occasion to make large-scale photographs of comparatively near objects or, on the other hand, to take views from an unusually distant standpoint, finds these long-focus R.R. lenses the most efficient and inexpensive instruments which he can include in his equipment.

These facts may serve to demonstrate that a well-selected battery of lenses, which does not necessarily mean a large number, is essential to the commercial photographer who wants to gain a reputation, not only for being able to do as good work as anyone else, but also for succeeding in getting good results where the other man's work will only just pass muster. It sometimes occurs that where a particular subject has been pronounced "impossible" by someone else, even a mediocre negative, improved by afterwork, may be found very acceptable by the customer.—*B. J.*

For the Man Who Writes Your Ads

When you have written an advertisement, read it over again, and then ask yourself:

Is it true?

Does it ring with sincerity?

Does it "knock" or even slur?

Has it too much novelty?

Is the language too flowery?

Is it grammatical?

Is the wording as direct and simple as it should be?

Does each word best express the meaning you want to convey?

Can any part of your text be misunderstood?

Are the punctuation and spelling correct?

Is there too much copy for the space?

Will your text of twenty-five words or fewer make the reader think of a hundred?

Does the illustration link up with the text?

Does it tell a story?

Does your "ad" as a whole have the atmosphere of the goods advertized?

Will it get your message across?

Will the type set-up and the general layout permit the text to be read easily?

Will the "ad" appeal directly to the audience you want it to reach?

In gauging the sales value of your text, have you put yourself in the reader's place?

Will it sell the goods?—*Publicity.*

ABSTRACTS AND TRANSLATIONS

BY E. J. WALL, F.R.P.S.

Namias gives the following formulas for making printing-out papers and cards which may be useful to those who like to make their own materials:

Gelatin	25 gr.
Zinc chloride cryst . .	6 gr.
Citric acid	5 gr.
Ammonia	6 c.c.
Distilled water to . .	1000 c.c.

Soak the gelatin in half a liter of water, pour off excess of water and melt in a water-bath. Dissolve the citric acid in a little water, add the ammonia, then the zinc salt; add to the melted gelatin and make the bulk up to one liter; filter whilst warm. The paper should be immersed in this solution and hung up to dry.

The sensitizing solution is:

Silver nitrate . . .	12 gr.
Citric acid	5 gr.
Glycerin	5 c.c.
Distilled water to . .	100 c.c.

This should be brushed over the surface of the paper with a soft brush, in gaslight, and the paper should be dried as rapidly as possible, if necessary by a gentle heat.

The tone of the prints with mere fixation is a reddish brown; but if tartaric acid be used, instead of the citric, a good dark brown is obtained.

Another sensitizer, which is slow in printing, is:

Silver nitrate . . .	12 gr.
Distilled water . . .	100 c.c.s.

This solution will keep a long time in the dark, and if 1 to 2 c.c. of a 5 per cent. solution of potassium bichromate be added the paper prints much harder.

A more rapid bath is

Silver nitrate . . .	10 gr.
Uranium nitrate. . .	5 gr.
Lactic acid	5 c.c.s.
Distilled water to . .	100 c.c.s.

Sepia tones can be obtained by the following bath.

Ammonio-citrate of iron (green)	20 gr.
Water	50 c.c.
Bichromate 5 per cent. sol.	5 c.c.

Dissolve and add

Silver nitrate . . .	10 gr.
Water	10 c.c.

and add to the iron solution, and then add

Water to	100 c.c.

This solution does not keep very well and it is better to use it at once. The prints intensify slightly when passed into water, and should be immersed in a 1 per cent. solution of oxalic acid, then washed and fixed in a 2 per cent. solution of hypo, not stronger or they are reduced.

Another formula is:

Ammonium chloride . .	0.4 gr.
Sodium citrate, neutral .	4.0 gr.
Casein	4.0 gr.
Water	80 c.c.

Add the casein to a little water, heat gently, then drop in ammonia and stir well till the casein dissolves; then add the salts and the remainder of the water, and finally

Silver nitrate . . .	7 gr.
Water	20 c.c.

The paper does not keep well but may be rendered more stable by immersing it, when dry, in a 3 per cent. solution of citric acid.—*Bull. Soc. Franc.*, 1920, 39.

Hurter Memorial Lecture

Renwick recently delivered the Hurter Memorial Lecture before the Liverpool (Eng.) section of the Society of Chemical Industry. This lecture is an extremely interesting and useful summary of our existing knowledge of the subject.

Renwick pointed out that the position and shape of the characteristic curve of a plate is influenced by the range of sizes and sensitiveness of the grains and their relative proportions in the emulsion, the extent to which development is carried, the temperature and duration of the action of the developer and its rate of absorption and diffusion in and out of the gelatin film. It has been assumed that the amount of silver in a negative is a reliable index of the amount of photoproduct or latent image formed by exposure; but some recent experiments in which a deliberately fogged emulsion was added tend to prove that this is not strictly true. Another important point is the size of the emulsion grain and the developed grain, and although coarse-grained emulsions tend to give coarse-grained negatives, there is practically no connection between the two.

The theories as to the nature of the latent image may be practically divided into those which assume a purely chemical change and those which rely upon a physical change, practically the setting free of electrons from the silver halide atoms. It has, of course, been known for some time that by treatment of exposed silver chloride emulsions with a bromide the whole of the chloride could be converted into the bromide and the latent image could be developed on the latter as well as on the former, but it has not been known that exposed silver bromide could be converted into silver iodide and successfully developed, for silver iodide *per se* is extremely difficult to develop. Renwick has, however, been successful using an alkaline amidol developer, which by the bye fogs silver bromide badly. The idoizing liquid was a 1 per cent. solution of iodide containing 2 to 3 per cent. of sodium sulphite and plates thus treated could be developed in white light.

Apparently the crystalline character of the silver bromide is changed by treatment with the iodide to the amorphous or microcrystalline state. The converted silver iodide can be reversed by light action, particularly by the blue rays between 430 and 450, and successful positives have been made in the camera with exposures of from five to fifteen minutes a f/8 in a well-lighted studio. The best iodizing solution for reversal is sodium iodide 1, sodium sulphite, cryst. 2, hypo 2-4, water 100.

Renwick comes to the conclusion that in the most sensitive plates we are dealing with crystalline silver bromide in which, besides gelatin, some highly unstable form of colloidal silver exists in solid solution, and that it is this dissolved silver which first undergoes change on exposure to light. The paper should be read in its entirety to be appreciated.—*J. S. C. I.*, 1920, 156*T*.

Color-sensitizing Collodion Emulsion

Von Huebl has again turned his attention to the color-sensitizing of collodion emulsions, and while this may be of little interest to the average photographer it is of some moment to the process worker. If the true isocyanins, pinaverdol, pinachrome and pinachrome violet are added to collodion emulsions the color sensitivity does not exceed four or five times that of a dry plate; but other dyes increase the color-sensitiveness from fifteen to twenty times that of a dry plate, and the most interesting of these dyes are pinacyanol, pinachrome blue, pinacyanol blue, dicyanine and ethyl violet.

To 100 parts of the mother emulsion are added 8 parts of a 1:1000 solution of the first-named dyes, and 2 parts of a similar strength solution of the second class of dyes. After the plate has been coated and the film set it should be washed to remove excess of dye, and it is during this washing that the color sensitiveness is attained, an unwashed emulsion gives very clean negatives but the color sensitiveness is low.

The sensitizing action is not alone traceable in the less refrangible rays, the red and green; but the sensitiveness of the emulsion to blue is actually better than that of the mother emulsion. The red sensitizers are particularly energetic; with pinachrome blue, for instance, the sensitiveness of the emulsion for white light is more than doubled, and relatively the sensitiveness to green and to red is greater than that of a gelatin emulsion with the same dye.

Winter has determined the sensitiveness of collodion emulsion, prepared according to von Huebl's chloro-bromide formula, under various filters, using as a light source an electric lamp, adjusted as to its spectral light emission by special filter so as to approximate daylight, and his results are given in the following table:

Sensitising red.	Relative sensitiveness of the dyed emulsion to the colors.				Ratio of sensitiveness. $\frac{\text{Red}}{\text{Green.}}$
	Green.	Red.	Yellow.	White.	
Pinaverdol	2.3	0.3	2.6	4.4	0.14
Orthochrom-T	2.0	0.3	2.3	4.0	0.18
Isocol	1.4	0.4	1.8	3.5	0.30
Pinachrome	1.6	0.5	2.1	3.7	0.33
Pinachrome Violet	1.1	1.1	2.2	3.5	1.00
Pinacyanol	1.3	2.8	4.1	5.0	2.10
Pinachrome Blue	2.5	5.2	7.7	9.0	2.10
Pinacyanol Blue	0.8	4.2	5.0	6.3	5.00
Dicyanine	1.0	4.5	5.5	6.6	4.50
Ethyl Violet	0.5	0.6	1.1	3.0	1.20

It is quite probable that these results are clear to all; but to obiate any mistake, let us take the case of the pinachrome-sensitized emulsion. The sensitiveness to green is 1.6 times the initial sensitiveness to blue, and the sensitiveness to red is one-half the initial sensitiveness; but as the red plus the green gives by admixture the sensitiveness to yellow, which is slightly more, 2.1 times that for the initial sensitiveness to blue, the actual sensitiveness of the emulsion to white light being 3.7 times the sensitiveness of the emulsion to blue before dyeing; therefore, the sensitiveness of the stained emulsion to blue is the difference between the sensitiveness to white light and the sensitiveness to yellow, or $3.7 - 2.1 = 1.6$, the sensitiveness to green.

Various tests proved that the pinachrome blue is the best sensitizer, the ratios of sensitiveness being—blue 1, green 2.3, red 4.8. It would seem preferable, therefore, to manipulate such an emulsion in blue light, which is somewhat subversive of our usual procedure.

Collodion emulsion, sensitized with pinachrome violet, ought to be considered as a really insochromatic film; that is to say, equally sensitive to all colors, for the ratios are blue 1.0, green 0.9, red 0.9.—*Zeitsch. f. Repro.*, 1920, 10.

"Organic Photographic Developers"

By S. Wein; published by Forty-Second Street Commercial Studio, New York. Price, $3.50.

In his preface the author states that "the following pages therefore constitutes (sic) an attempt to present to the busy chemist and photographer a concise chronological review of the literature of photographic developers." My advice to both classes is to let the book severely alone, for I cannot recall ever having perused a book with so many errors in it. It contains 128 pages in all, and is divided into two volumes, the first dealing with developers. The patents are in chronological order, but there is no indication what the patent is for, and one has, therefore, to wade through each one to find out what can be made by the given process. Chronological may be natural, but gathering all the patents dealing with one subject together is much more satisfactory and saves time to the reader.

Four pages are sufficient to exhaust, according to the author, the patents on sensitizing and other dyes. The early German patents for making the isocyanin dyes, about twenty in all, are ignored, and even the U.S.P. patent granted to Miethe and Traube for ethyl red is said to be for pinacyanol.

Of the second volume, some 69 pages, the author says: "The following pages *is* (sic) a complete survey of all the chemical manipulations involved in photography." It is not, and is such a hotch-potch that I am compelled to think that the author is not a practical photographer. Here we are told that if a negative is too opaque it requires "reduction" or "bleaching," and unless the reader actually knows something of practical work it is impossible to make head or tail of the jumble, for one cannot see how to reduce by bleaching.

I am possibly oversensitive to typographical errors, but when in a book of this size, only 128 pages in all, there are only 23 pages without typographical errors, even the average reader might object. In two cases, whole paragraphs of eight lines are bodily printed twice. The author seems to ignore the somewhat generally accepted rule of Lindley Murray that plural nouns require plural verbs.

The worst feature of the whole book is the gross errors that are quite misleading. For instance we are told that paramine is paraphenylendiamine hydrochloride, and it is not; nor is diamine a diamidoresorcin; nor paramol, paramidophenol. As regards the chemical formulas for developers, the author is hopelessly at sea; on one page, 24 are given and 10 are wrong. That the printer should ignore the usual conventional method of representing the benzol ring, or the Greek letters in compound rings, or the inferior subscripts, so that they are superior, is, of course, a matter of personal taste.
—*E. J. W.*

VIEWS AND REVIEWS

The National Convention

As we go to press the National Convention is in progress at Milwaukee. A full report will be published in our October issue.

The Fourth International Photographic Salon, 1921

The Fourth International Photographic Salon, under the auspices of the Camera Pictorialists of Los Angeles, will be held in the Gallery of Fine and Applied Arts, Museum of History, Science and Art, Exposition Park, Los Angeles, California, U. S. A., from January 4 to 31, 1921. The exhibition will be open from 10 A.M. to 4 P.M. (except Wednesday afternoons), and on Sundays open from 2 P.M. to 5 P.M.

The aim of the Salon is to exhibit only that class of work in pictorial photography in which there is distinct evidence of personal artistic feeling and execution.

All work submitted to the Jury of Selection will be carefully and impartially considered, but no picture will be eligible that has been previously exhibited in Los Angeles.

All pictorialists are cordially invited to contribute. Address all correspondence and entrance fee to Louis Fleckenstein, Room 31, Walker Auditorium, Los Angeles, California, U. S. A.

Instruction in Art Photography—Advanced Class October 7th, 1920, to April 7th, 1921

Recognizing the broadening influences of artistic photography in portraiture, magazine illustration, and as a medium of art expression, the Department of Photography of the Brooklyn Institute of Arts and Sciences has again secured the coöperation of Mr. Clarence H. White, of Columbia University.

This course will consist of fourteen sessions, beginning October 7, 1920, and ending April 7, 1921. The class will meet on the first Thursday evening in each month, at 7.45 P.M., and there will be seven Saturday afternoons at studio work.

Anyone interested in photography, living near New York and Brooklyn, will be well repaid by attending this special course, which is open to beginners as well as advanced workers. It is an unusual opportunity for all photographers.

The cost of tuition for members of the institute is $10.00, and $14.00 for all other persons.

Write for prospectus, giving full particulars. Address: The Brooklyn Institute of Arts and Sciences, Academy of Music Building, Brooklyn, N. Y., or Mr. W. A. Alcock, 346 Seventy-third Street, Brooklyn, N. Y.

Rochester Man's Invention to Revolutionize Retouching

Bert J. Tibbals, photographer, of Rochester, N. Y., says *Abel's*, has succeeded after much experimentation in evolving a new negative modeling medium, soon to be distributed nationally. Its development was made possible by the discovery of a peculiar slag-like mineral substance found only in Brazil.

The main advantage of this modeling medium, aside from the effective manner in which it will take down high light density and cut away outline contour which is undesirable in the finished print, is the fact that the surface left on the emulsion of the negative after as much of the metallic silver image has been cut down as required, leaves that surface as smooth as glass on which to do whatever retouching may be necessary. Etching with the knife always leaves a ridgy, uneven surface on the emulsion, so that when pencil work is introduced thereon, to cover up the marks left by the knife, it will always show a grain or stipple. This has to be spotted out in the print. A double chin or an over-plump arm may be entirely remodeled by the application of this medium, so that it will positively not show in the print. It will also leave a soft contour line, unlike the knife, which leaves a sharp, harsh outline.

The Fairchild Aerial Camera and Developing Machine

We have received from the Fairchild Aerial Camera Corporation, of 17 West 42d Street, New York City, particulars of a most interesting camera and developing machine for use in connection with it. The camera is automatic in action and is intended for aerial mapping or oblique views. It is automatic in action and is driven by a motor actuated by a 12-volt storage battery mounted on the camera suspension, and can be used in a single-seater aeroplane. A roll film is carried in a detachable magazine, making it possible to carry any number of rolls and to change them while in the air. Each magazine has a capacity of seventy-five feet, enabling the operator to obtain 150 exposures, 13 x 18 cm. each. This is accomplished by an automatic equal-spacing device which does away with any wastage of film. The camera is entirely under control for regulating the interval between exposures, has a switch for stopping and starting the camera, or making it hand controlled only, and there is also a pilot light which flashes each time the camera takes a picture and a recorder giving the number of exposures. A Fairchild high-efficiency between-lens shutter is fitted with a range of exposure from $\frac{1}{30}$th to $\frac{1}{200}$th of a second, and a 10-in. *f*/4.5 anastigmat is fitted as standard.

A smaller type of hand-held aerial camera for pictures 5 x 4, and for use with plates which are held in a magazine, is also available. This camera is fitted with a focal-plane shutter and an 8½-inch *f*/4.5 anastigmat.

The Fairchild daylight developing machine appears to be a remarkable piece of apparatus for dealing in a very speedy manner with the long length of film used in the larger camera. The machine is also motor driven and is arranged so that the exposed film is fed into it at one side from the magazine, and the negatives are developed, fixed, washed, dried, and delivered at the other side at the rate of one each minute, or, if the machine is speeded up and more concentrated developer used in the tank, one each twenty-five seconds. The interior of the machine is a series of tanks and rollers, the film being entirely submerged until the washing is complete. The first tank contains the developer, the second a stop solution, the third and fourth fixing solutions, the fifth and sixth washing water (this is so arranged that running water can be used when available), and the seventh is the drying tank through which warm air is pumped. As the film emerges from the drying tank it is taken up as fast as it feeds out, passes over a shelf on which is mounted a cutting knife for cutting off the separate films as they appear. The machine occupies a space 15 x 42 x 60-in. and is light in weight.

The camera and developing machine, both of which are one-man instruments, are the invention of Mr. S. M. Fairchild, who designed them for practical use during the war, when speed in production of aircraft negatives was of the utmost importance.

Members' Work at the Camera Club

The exhibition of members' work at the Camera Club, New York, which was held in the spacious galleries of that organization during the month of August, was the most successful, in the number of prints shown, their quality and in attendance and interest, that has been given for years.

Twelve pictures were selected by Mr. W. G. Bowdoin, art editor of *The World*, at the request of the print committee, and these will be hung permanently in the rooms of the Club. The list follows: R. A. Warrender, a harbor scene in a high key and a nocturne; Floyd Vail, F.R.P.S., a snow scene entitled, "A White Christmas," which was exhibited at the Royal Photographic Society's salon, 1918; Ben T. Luboshez, an interior of the Pennsylvania Railway Station; Miss Esta Varez, a figure study; F. E. Vail, a portrait; N. C. Owen, a space decoration; Miss Lorraine Harding, a portrait; John W. Allison, a beach scene, with nude; W. E. Wilmerding, a landscape; M. W. Tingley, a nude; and J. B. Tarbell, a buffalo head.

There were many other excellent exhibits by different pictorialists, among the best being those by Ned Van Buren; Sparks Frieman, Helen M. Murdock and H. A. Labiner, both of Boston; José Luis Requena, of Mexico; H. P. David, R. W. Burke, Mr. Bernstein, Edward Heim, Leonard M. Davis, M. Sugimoto, W. N. Capon, H. Galoupean; Dr. Krewder, Dr. M. Dagenhardt, Geo. W. Stephenson, F. S. Hastings, etc.

An Acknowledgement

In our August issue, on page 331 of *The Workroom*, we published an article on "Making Enlargements from Film Negatives." This was reprinted from *Portrait*, and due credit should have been given. The omission was an oversight, which we regret.

Royal Photographic Society

At the meeting of the Scientific and Technical Group, on June 8, Sir William Pope presented the second of a series of papers by himself and Mr.

W. H. Mills on "Photographic Sensitizers." The "carbocyanines," considered in this paper are formed by the condensation of two molecules of a quinoldinium alkyl iodide in the presence of formaldehyde; they differ from the isocyanines previously described in that the two quinoline groups are attached at the 2,2′ positions by the 3-carbon linking: CH.CH.CH., instead of by the simpler link: CH. at the 2, 4′ positions, and also in sensitizing further into the red end of the spectrum. The best-known member of the group is the 1-1′ diethyl compound, which is in use under the name sensitol red (German, pinacyanol). About 20 carbocyanines were described, variations being made both in the number, position, and composition of the substituting radicles, and the wedge-spectra of plates sentitized by them were shown in color on the screen. As in the case of the isocyanines, substitution in some positions has a considerable depressing effect on the sensitizing action. In the subsequent discussion Sir William Pope suggested that the essential characteristic of the carbocyanines is the 3-carbon linking, :CH.CH.CH., and not the position of connection to the quinoline groups.

Mr. G. I. Hogson described and exhibited a neat device for obtaining non-intermittent graded exposures of known values. The photographic plate is moved by means of a governed dictaphone motor under an opening of any desired shape; the actual speed of movement and any irregularities in it are obtained by means of an electrically operated time-marker, controlled by a metronome, which marks off definite time intervals on a smoked glass attached to the table which carries the plate.

Condensed Course in Motion-Picture Photography

Edited by Carl Louis Gregory, F.R.P.S., Chief Instructor in Cinematography for the Government Signal Corps School of Photography, Columbia University. Large octavo, 382 pages. Fully illustrated with original photographs and diagrams. Cloth, $6.00. New York, U.S.A.: New York Institute of Photography, 145 West Thirty-sixth Street, 1920.

This book has been carefully prepared and is published for the instruction of any one interested in motion-picture photography. It is a complete and thorough course covering fully every phase of the subject, and contains about 400 pages of text, in simple, concise language, and has 100 pages of illustrations.

The facts and data are important and the lesson-chapters are sure to be continually referred to as an encyclopedia of camera man's information and as a complete authority and reference.

Special chapters were arranged by the Research Laboratories of the Eastman Kodak Company and by Charles W. Hoffman, formerly feature photographer for the Thanhouser, Edison, Pathe, World Film companies and for the United States Government.

Photographers' Association of the Pacific Northwest

Tacoma, Wash , Sept, 14, 15, 16, 17, 1920

Convention

Never before has there been shown so much enthusiasm and interest in a photographic convention as at this time. The response with dues is unusually large, and if you have not sent in yours, do it now.

A report from the President, Mr. Evans, is to the effect that we will be granted a charter to the national association, thereby getting the benefit of the very latest and best work in our chosen art.

Convention Hall. We have been fortunate in securing the use of the large reception room and banquet halls of the Masonic Temple, which is centrally located.

Interesting Displays. At a recent meeting of the Executive Board it was decided to award diplomas and to give ratings on exhibits—six photographs 4 x 6 or larger—to our members.

Diplomas and ratings will be awarded by three competent judges; so get busy with your exhibit. We expect each member to contribute pictures for this exhibit. Notify the secretary when your exhibit will be ready.

Instructive Demonstrations. Displays and demonstrations from the principal manufacturers and dealers will be an enjoyable feature of this convention.

Question to be Voted Upon. Shall we choose one picture from each of the six exhibits securing the highest rating as a Salon picture to become the property of the Association?

Yours truly for a bigger convention.
Frank J. Lee, Secy.-Treas.,
1535 Commerce Street, Tacoma, Wash.

Agent For Ica-Contessa and Carl Zeiss Products

Mr. Harold M. Bennett announces that he is sole agent in this country for the Ica-Contessa cameras and the optical products of Carl Zeiss. Mr. Bennett has handled the Ica cameras here with considerable success, and it is to be hoped that the new supply of these high-class and well-known goods will meet the constantly increasing demand.

The WORKROOM

CONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

Miniature Photographs on Watch Dials, Porcelain, Opal and Ivory of Exceptional Brilliancy
Home-made Backgrounds
Photographing Cut Flowers
Judging Density in Lantern-slide Making
Marginal Fog
Hydroquinone Caustic Developer
The Pyro Developer
Rapid Plates and Flat Negatives
Beginners' Difficulties in Bromide Enlarging
Home-made Transparency Plates
Dirt in the Dark-room
The Stereoscopic Photography of Small Objects
Detecting Pinholes in Camera Bellows
Paper Negatives
Photographic Materials and Processes

THE WORKROOM

By the Head Operator

Miniature Photographs on Watch Dials, Porcelain, Opal and Ivory of Exceptional Brilliancy

By Alfred J. Jarman

Every photographic novelty has more or less value, and while some photographers do not care to bother with the unusual or novel things, there are others who take special delight in doing the things that seem difficult, and at the same time derive a considerable amount of profit from doing them.

The purpose of this article is not to sell an idea, however, but merely to give the process by which novel miniature portraits may be made by any one interested enough to go to the necessary trouble. One of the most common demands is for these miniature portraits on watch dials.

The first requisite for a miniature portrait is a negative of the exact size that the picture is to be made, and the negative must have considerable snap and brilliancy; a thin, flat negative cannot be used for the purpose. The negative may be an original, but is usually a copy of a good glossy print. It is less expensive to copy a good print, and the reduction is usually so great that the result is all that could be desired.

Use a process film or plate. If for any reason the picture looks best reversed, use a film and reverse it in the holder in making the negative.

Any good developer will answer the purpose if it produces snappy negatives. If your developer does not do this, retard it with a few drops of 10 per cent. bromide of potassium.

An excellent developer for this work is made as follows:

A

Elon	120 grains
Hot distilled water	8 ounces
E. K. Co. sulphite of soda	360 grains

B

Hydrochinon	120 grains
Hot distilled water	8 ounces
E. K. Co. sulphite of soda	360 grains

C

Distilled water	8 ounces
Potassium carbonate	2 ounces

Keep the solutions in separate bottles and they will always be ready for use.

For use take A 5 drams, B 5 drams, C 9 drams and add 12 drops of a 10 per cent. solution of potassium bromide and 3 ounces of distilled water.

Develop in a clean tray, but keep the tray covered for at least half a minute. Full development will be reached in about one minute if exposure has been correct.

Any good fixing bath will answer, but the chrome alum bath recommended for films or plates is preferable. After fixing, wash the negative thoroughly and wipe it with a tuft of wet absorbent cotton; then dry it away from dust, as a miniature negative must, above all things, be clean.

As this is a transfer process a suitable paper must be prepared for printing the photograph so that it may be stripped from its support. Procure a few feet of baryta-coated paper, such as is used for coating with glossy photographic emulsion; if this is difficult to obtain, any good paper will answer if it is given time in the coating to take on a good coating of the soluble stripping mixture. Cut this into pieces about 6½ x 8½ and roll them so that the baryta coating faces outward. Prepare the following solution, which will give an easily soluble base when placed in warm water:

Soluble Stripping Mixture

Soft gelatin	360 grains
Granualted sugar	120 grains
Water	12 ounces

Place the gelatin in the water and let it soak for half an hour. Add the sugar, and heat the mixture until the gelatin is completely dissolved. Stir well, add half an ounce of a 5 per cent. solution of carbolic acid and then strain through a piece of washed muslin. Pour this mixture into a clean 8 x 10 enamelled or glass tray, the temperature of the mixture being at about 90° F.

Plate a sheet of the baryta-coated paper face down on the solution, by holding it at opposite corners so that the middle of the paper touches the solution first, then lower the corners so that the paper floats upon the surface. The solution must not be allowed to run over on the back of the paper.

The corners of the paper should be carefully lifted, one at a time, to see if there are any air-bubbles upon the surface of the paper. If there are any, break them with the tip of the finger, rub the spot lightly and carefully lower the paper again. It may now be lifted from the solution and one corner drained against the side of the tray. The coated paper may now be pinned against the front edge of a shelf to drain and dry in a place that is free from dust.

As soon as the coated paper is dry the lower thickened edges may be trimmed off and the sheets placed under weight, where they will be kept flat until ready for use.

This paper will keep almost indefinitely previous to sensitizing.

Sensitizing the Paper

Six small bottles will be required for making the sensitizing solution, three of them being five-ounce amber-glass bottles.

SOLUTION A

Pyroxilin (soluble cotton)	40 grains
Pure photographic alcohol	2 ounces
Sulphuric ether	2 ounces

SOLUTION B

Recrystallized nitrate of silver	120 grains
Distilled water	2 drams

The above quantity of silver will just dissolve in the two drams of water.

SOLUTION C

Pure alcohol	1 ounce
Chloride of strontium	32 grains

SOLUTION D

Citric acid	32 grains
Pure alcohol	1 ounce

Shake the A mixture until the cotton has completely disolved. Pour this into a five-ounce amber-glass bottle and add in the exact proportions: Thirty drops of B in one dram of pure alcohol. Shake the mixture well. Then add one dram of C, a few drops at a time, shake well, and finally add thirty drops of D and shake well. Let the mixture stand for half an hour, then filter through a small tuft of absorbent cotton into another five-ounce amber-glass bottle. All these mixing operations must be under a yellow light.

When the filtering is complete the mixture will be ready for use. It will keep in good working condition for a month.

To coat a sheet of paper, turn the edges over for a quarter of an inch upon a flat ruler so the sheet of paper forms a shallow tray. Cut a piece of stiff cardboard a little larger than the folded paper, and stick each corner to the cardboard with a touch of sealing wax. Bend down the opposite corners so that lips are formed. Now, under a yellow light, pour a pool of the sensitizing mixture into the paper tray and allow it to run to each corner quickly, and drain the excess into the bottle it was poured from, by one of the lips. In this operation the entire surface of the paper should be covered with the solution. Rock the paper tray to secure an even surface, then pin it by one corner to the edge of a shelf to dry, which will take about ten minutes. Re-coat the paper in the same way, pouring on the sensitive collodion from the opposite corner, pouring it off and rocking the tray to give a perfectly even coating. Pin up to dry from the opposite corner, away from actinic light and dust.

Printing, Toning and Fixing

Printing is the same as for any printing-out paper, by a strong artificial light or by sunlight. It is important to have perfect contact, so a good pad should be used in the printing frame. Printing should be about two shades darker than is required for the finished print.

When the prints have been made, place them in water for about a minute and then place them face down on a piece of clean glass, squeegee out the water and allow them to stand for twenty minutes. This is to take the curl out of the prints before they are toned. Then rinse in four or five changes of water, keeping them flattened as much as possible, when they will be ready to tone. If prints are very small the curl will not be enough to cause much trouble and the flattening process may be eliminated.

TONING SOLUTION

Water	16 ounces
Chloride of gold	3 grains
Saturated solution of borax	1½ ounces

This toning solution should be made up and allowed to stand at least an hour before using. Prints should be toned long enough to at least clear the highlights. Long toning will give more of a blue color and will require slightly darker prints. The toning solution can be bottled and used again and may be strengthened by the addition of gold and borax when necessary.

Fix the prints in a plain hypo fixing bath, 1 ounce of hypo to 10 ounces of water. Under no circumstances should an acid or alum fixing bath be used. Fixing will be complete in two or three minutes, when the prints should be washed in half a dozen changes of cold water, allowing a minute or two between changes.

For watch dials the miniature photograph should be cut to the size required after printing and before toning and fixing. If the print is to be an oval or circle it should be cut pear-shaped so there will be a handle by which the print can be held without touching the picture. This tailpiece can be cut off at the time of transfer.

When the print has been toned, fixed and washed, wet a piece of smooth writing paper that is fairly thin and place it in contact with the print and rub down carefully between blotters.

The watch dial having been thoroughly cleaned by washing with warm water containing a little washing soda, rinsed and dried, is ready for the transfer.

A pair of tweezers will now come in handy. Grip the print with its plain paper covering at the extreme edge, but so the two will be firmly held together. Dip into warm water, about 90° F. (but not over 100° F.) and take it out immediately. Dip again and carefully drain the excess of water against the edge of a torn blotter. Lay the print on the blotter and carefully slide off the original paper support, leaving the print on the temporary support. The sugar-gelatin readily melts and leaves just enough adhesive material upon the surface of the print to stick it to the dial.

The print may now be placed in contact with the dial and a small piece of blotting paper used to carefully rub it down. From one corner the temporary paper support is slowly lifted away, leaving the print on the dial. The picture is now left to dry, when it is flowed over with a solution of white gum arabic. The entire dial may be flowed or the gum may be placed on the print with a brush, extending the covering just beyond the edges of the print. It is then allowed to dry again. The gum arabic solution is made as follows:

White gum arabic (in gum tears)	1 ounce av.
Distilled water	8 ounces
5 per cent. solution carbolic acid	½ ounce

This solution must be strained through a piece of well-washed muslin to make it free from dust or grit and used when quite clear.

As soon as the gum coating is dry the picture may be coated with Kodalak W. P. to waterproof it.—*Photo Digest.*

Home-made Backgrounds

Some form of evenly tinted background is a great convenience to the portrait worker, who has not a plain wall in the room in which his work is done. The background with a painted pattern on it is a thing best left to the professional; it is generally incongruous and sometimes positively absurd. The same objection does not apply to the plain ground, which does not purport to be anything in particular, and simply provides a smooth expanse of tone behind the sitter; and it is a background of this character which is likely to be most serviceable to the amateur who wishes to make half-length portraits of his friends. For full-length figures it is better to dispense with a background and to use natural surroundings.

Extemporized backgrounds of brown paper, blanket, or a similar kind are only really satisfactory if they can be thrown so much out of focus that their temporary and makeshift character is no longer apparent. It is surprising how difficult this is with the comparatively small stops and short-focus lenses in use by the amateur. Try as we may, the print will nearly always have some change of tone on it to hint at a crease or a wave, which "gives the show away." The only dodge that can be relied upon in such a case is to make use of the services of a friend to keep the background in motion during the exposure: and this is not always possible.

On the whole it is much better to have a background specially made for portraiture, and one that is kept permanently stretched on a frame. With the rollable backgrounds the vertical edges invariably curl to some extent, and one has to have them a good deal wider than is actually included in the picture in order to exclude these edges.

It is quite an easy matter to make a background at home which will serve as well as, if not actually better than, a bought background. The material may be any fabric which can be bought sufficiently wide to make the background without a join: unbleached sheeting is generally the cheapest that is obtainable in a good width.

It will be gathered that a join is undesirable; but if this cannot be avoided it may be made almost unnoticeable even when the background is dead sharp, and quite unnoticeable when it is a little out of focus, as in good portraiture it is sure to be. To accomplish this the seam should be vertical, not horizontal, and it should be made and ironed out quite flat before proceeding to stretch the background on its frame.

The first step to take, when the material has been obtained, is to construct a framework on which to stretch it. This is made of battens, which, for a size likely to be used by the amateur, may be 2½ × 1½ or even 2 × 1 in. The ends must be halved and let in to each other so that the frame has a flat surface all round. Thinner battens may be nailed across diagonally at the back, or strips of matchboard two or three feet long may be used for the same purpose. The corners should be carefully squared up before these stays are fastened. When the background has been painted and is quite dry they can be removed, as the need for their presence will have gone by.

An alternative method is to let in the stays so that they also are flush with the frame. They can then remain permanently in position, and a second layer of fabric can be put on the back and given a different tint. This is better than giving the back of the one fabric a tint of its own, as the frame is apt to get in the way, both when painting the fabric and afterwards when the background is in use.

When the frame is made it is laid flat on the floor and the fabric is stretched on it. The first step is to spread out the material as evenly as possible, so as to see how it is coming, and then to fasten it to the frame by tacks inserted in the middle of two opposite sides. The material is folded over and fastened along the edge, not on the face of the background. The centres of the two other edges are then fastened in the same way. The material should be pulled tight enough to make it flat, or with only a slight sag in the middle as it lies on the ground; it should not be violently strained, as if any great force is used there is likely to be trouble in avoiding any wrinkles on its surface.

When the centres are made secure the tacking may proceed outwards in both directions from each until the corners are reached, pulling the fabric just tight enough to avoid any folds. The frame can then be raised into a vertical position for painting, and the background should appear without a single wrinkle on its surface. It is well to let it stand on some sheets of newspaper spread out on the floor, as it is impossible to do the sizing and painting quite without splashing, and the splashes of either are very difficult to clear up.

Before applying the distemper, which is the most convenient form of paint for the amateur, it must have a coat, or even two, of size. Size for the purpose can be obtained from the oilman. A couple of pounds should be put into a bucket, and half a gallon of boiling water over it, when the greater part of it will at once dissolve.

A cloth, wetted in hot water and wrung out, is then put over the top of another bucket, and the size, having been well stirred up, is poured on to the cloth, to strain out any particles of dirt or skin. Then, with as large a whitewashing brush as is available, the size is well brushed into the material, starting at one top corner, and working gradually outwards, not merely flooding the surface, but applying sparingly and working it well into the fabric. When it is complete it must be left to get perfectly dry. When dry, the size may be warmed up again and a second coating given, although this is not absolutely necessary.

The paint may be either plain whitewash, or whitewash toned down to a gray; or we may use one of the ready made distempers which are obtainable in tins ready for use. We have used "Hall's Distemper," which is of a very fine even character and answers very well for this purpose. It can be obtained in a great variety of tints, although none of them are very dark; and if a very dark shade is required, black must be added to the distemper as described in a subsequent paragraph.

If whitewash is used, a couple of balls of whiting should be put into a bucket, covered with hot water, and stirred up with a strip of wood to make a smooth cream. If it is to be toned down in color, finely powdered bone-black or other powder color, which is also obtainable from the oilman, is added and well mixed in.

The actual color of the background is, in a sense, of no importance. What is of importance is the depth of tone which it will possess when photographed. Whether this is obtained with a pigment of a warm (reddish) or of a cool (bluish) shade, only matters in so far as it may mislead the photographer, when arranging his subject, into the belief that the background will come out lighter or darker than proves to be the case. Bluish colors photograph lighter, reds usually show up darker; but some pinkish reds photograph unexpectedly light. Neutral grays are in this respect the best, whether for light or dark backgrounds.

The mixing must be very thorough; and, with some colors, it will be necessary to strain the mixture through a cloth to ensure freedom from lumps. The shade must be tested by smearing a little on a piece of wood or card, and letting it dry as the tint when dry is very much lighter than it is while wet. When the mixture is what is required, some of the warm size and water, similar to that already applied to the fabric, is added, in the proportion of a quart of the size to a pint of the cream. It is thoroughly stirred to incorporate size and color, and then left to go cold. When cold it should set into a thin jelly, in which form it can be applied to the stretched material.

The painting is done in exactly the same way as the sizing. The brush after sizing should have been well washed in warm water and allowed to dry. Dipping it into the jelly, which will be found to work up into a kind of liquid condition under the brush, it is applied in a series of strokes, first downwards and then across, so that brush marks are almost obliterated. It should be used sparingly, only dipping the brush in the bucket again when it has reached the stage that it ceases to leave any color on the fabric.

Most failures are due to an attempt to substitute a lavish use of the whitewash for the necessary work of brushing it evenly. Slight brush marks will vanish as the coating dries. After a day or two it will be quite dry and may be handled; but, until it is absolutely dry, any touch on the moist surface will leave a permanent mark.—*C. E. T.*

Photographing Cut Flowers

When we undertake to photograph flowers in our gardens or out in the fields we must accept conditions as we find them. If the wind is blowing we must await its pleasure, for flowers nod responsively to every breeze that blows.

But in photographing cut flowers or potted plants we can control the conditions, for we can take their pictures in any well-lighted room, where we can arrange the flowers and the lighting to suit ourselves.

The secret of success in indoor flower photography will be found in the right lighting and the use of a suitable background.

One of the simplest and most satisfactory ways to light flowers that are to be photographed in the house is, to place them a few feet from a window, with a reflector, which may consist of a sheet of white cloth or white paper, placed so that it will reflect light to the side of the flowers that is farthest from the window.

White flowers may be photographed directly opposite a window, if desired, but they can usually be pictured more satisfactorily if they are lighted in the way that all flowers that are not white should be, that is, they should be so placed that the light from the window will reach both the front and one side of them. This lighting can be obtained by any window that is to one side and a little in front of the flowers.

The light should come downward as well as from the side, at an angle of about 45 degrees, so that the strongest light on each flower will be near the top of it.

The background must photograph either lighter or darker than the flowers or they will be invisible in the picture. Should red flowers, which photograph black, be pictured against a black ground, or should white flowers be pictured against a white ground, the result will be a total failure. On the other hand, should red flowers be photographed against a white ground and white flowers against a black ground the result, in both cases, will be a picture showing the flowers clearly outlined against the background.

Flowers not only vary greatly in color, but different flowers on the same plant may show different tones or shades of the same color, and, when in doubt about the tone (white, gray or black) in which they will photograph, and also when a group of different colored flowers is to be photographed, it is wise to use a background that will photograph gray. In fact, such a background will usually prove satisfactory for flowers of all colors, and it need consist of nothing more than a wide sheet of ordinary tan-colored wrapping paper free from wrinkles.

Whether to use a filter or not will depend on how the flowers will photograph, with and without a filter.

When no filter is used, white and light blue flowers will photograph white. Dark blue flowers will, usually, photograph gray; light green and pale yellow ones will also photograph gray; dark green and deep yellow ones will photograph quite dark; while orange and red flowers will photograph black.

Blue will photograph darker and yellow

lighter with a Kodak Color Filter than without it. A Wratten K2 filter will make blue photograph somewhat darker and yellow quite a bit lighter than the Kodak Color Filter does. Both filters will slightly lighten the rendering of orange, but neither will have any effect on the rendering of red, which will always photograph black, unless a special plate that is sensitive to red is used.

Those who have photographed red or orange or yellow flowers and have found that some parts of the flowers were rendered white while other parts were rendered black in the pictures, may have wondered how this happened. This sometimes occurs with flowers that have glossy or wax-like petals. All glossy surfaces, no matter what color underlies the gloss, will reflect white light, and the way to avoid getting these black-and-white effects when photographing glossy petaled flowers is to light them so that the light on the shadow side will be nearly as strong as the light on the window side of them; then be careful not to over-develop the negative, and in printing make the print on Special Velox.

By using a Kodak Portrait Attachment the fixed-focus box Brownies and Premos can be placed as close as 3½ feet from the flowers, and the folding Kodaks, Premos and Brownies can be placed as close as 2 feet 8 inches from them. The closer the camera is to the subject the larger will be the image of the subject in the picture.

A filter can be used in front of a portrait attachment when desired. If both filter and portrait attachment are mounted in cells which slip over the hood or flange of the lens, the front of the filter cell should be placed in contact with the front of the portrait attachment cell, and the two bound together with adhesive paper or tape.

When this is done the two cells will look exactly alike, and a pencil or penknife mark should be placed on the filter cell, to make sure that the filter will always be used in *front* of the portrait attachment. Unless the portrait attachment is placed next to the lens, with the filter in front of it, the picture will be blurred.

The exposure to give cannot be definitely stated, as this will depend on the light conditions and the stop used, but the writer has always obtained fully timed negatives, when the flowers were not more than 3 feet from a window through which no sun was shining, between the hours of 9 and 4, by giving an exposure of from one to two seconds, with stop 16.

With a Kodak Color Filter the exposure must be about 10 times as long, and with a Wratten K2 Filter it must be about 20 times as long as would be needed without a filter.

These factors of 10 and 20 are calculated for rendering the same amount of shadow detail as will be secured with exposures that are, respectively, $\frac{1}{10}$ and $\frac{1}{20}$ as long without a filter.

Judging Density in Lantern-slide Making

It will be found a great help (writes Mr. H. P. Freeman in *Photography and Focus*) to have a uniform light by which to judge the slides. One skilful amateur photographer of our acquaintance, who makes many slides, has a little dark-room lantern which he keeps for this special purpose. It contains an oil lamp, and has a piece of opal glass backed up by a deep yellow light-filter. The lamp glass is masked so that its opening is only 3¼ x 3¼ inches, and against this each lantern-plate, as it is developed, is carefully examined. Being in his dark-room recently when slide-making was in progress, we noted also that he did not worry to look at the slide in the early stages of development at all, keeping the dish covered and rocking it occasionally until the process was very evidently nearing completion.

With highly restrained developers for very warm tones, it is well, we find, to supplement any examination of the slide by looking through it, by taking the temperature of the solution and the time of development. In this way, if on fixing the slide it should be apparent that an error in development has been made, it is an easy matter to make another, with the note which we have made of the time of development supplementing any conclusion which we may draw from looking at the slide.

Marginal Fog

It sometimes happens that the excessive taking of precautions is the cause of defects in negatives which would never have occurred at all to a more happy-go-lucky worker. We had an instance of this the other day in some negatives which were shown to us with the suggestion that they were due to stale plates as evidenced by the narrow band of fog along the edge. We did not agree, because in the first place the fog had not the dichroic appearance which is usually associated with staleness of the emulsion, and in the second place it occurred only on two sides of the plate. While it is admittedly possible that the packing of plates may be such that they suffer on two edges only, it is rare for this to be the case, and we sought other causes for the phenomenon. We found it in our friend's camera, a heavily built landscape instrument with the back frame of rather more than ordinary thickness. A glance at the interior showed that the portions of this back frame adjacent to the plate, when the latter was exposed to the lens, were about as shiny as they well could be. Inquiry showed that it was this worker's practice to rub the entire inner woodwork of the camera with a duster before taking it out for use, with the result that what originally was a dead black surface had been rubbed up to quite a respectable polish, and one which, according to the subject, was capable of reflecting a narrow band of light upon the edge of the plate. Reflections from the inner woodwork of a camera are responsible for more markings on plates than many perhaps realize; and one of the things which may well be done every few months is to touch over wood or metal surfaces which can possibly come within the field of the lens with a little dead black.—*B. J.*

Hydroquinone Caustic Developer

This is the favorite developer for line work, but certain precautions are needed in its use. Forcing nearly always results in a deep brown stain, and so sometimes does omission to rinse the plate well between developing and fixing. For regular work of good quality a fixed time of development at a certain temperature is almost a *sine qua non*, and the temperature in no case should be below 60° or over 75° F. A further point is that the developer should not be used more than once. This may seem wasteful, but I have proved it to be the only reliable method of working.

It may not be generally known that his developer can be used to make a rich bromide print from a flat negative. This extra contrast is not so great as is obtained when gaslight paper is used, and the hint is therefore more likely to be of use in enlarging than in contact printing. Here again the developer can be used once only. Therefore small trial slips should be made, and then the final print well wetted and rained, so that a small quantiy of developer can be used for it.—*B. J.*

The Pyro Developer

There is a prevalent idea that the various developing agents, such as pyro, hydroquinone, metol, and amidol differ widely in their action, and that each will only produce a certain class of negative. A little experimenting will prove that this is true only to a very limited extent, if at all, as it will be found that images of almost any desired character may be obtained with the same developer. Metol, without the addition of hydroquinone is reputed to give soft images, tending to flatness, but if sufficiently concentrated and allowed to act long enough, black and white line negatives may be obtained. The fact is, as pointed out by Mr. Watkins, that the ratio of the time which is needed for the appearance of the image and that needed to attain the required degree of density varies greatly with different developers, and this has led to the impression that what are generally called long-factor developers give thin images while short-factor ones give strong ones.

What we may call flexibility in a developer is a valuable quality, that is to say, it is easy so to modify the solution that thin or dense images may be readily obtained without unduly prolonging the time of development, and this quality is, we believe, present in pyro-soda to a greater extent than in most other developers.

In considering this subject we must keep in mind the elementary fact that the degree of contrast in a correctly exposed negative is directly controlled by the period of development, and by varying this we may obtain anything from a mere ghost of an image to one which is too hard for any ordinary purpose There is, however, a slight departure from this rule when the solution used contains bromide, as the action of the developer upon the darkest parts of the subject is delayed in a greater degree than it is during the earlier stages of development upon the highlights. If the image be developed "right out" or until all the exposed silver bromide has been reduced, the effect of bromide is practically nil.

In the ordinary way no bromide solution is necessary or desirable with pyro-soda, but, when used, its action is most energetic, a very small quantity being sufficient to have a marked effect. This quality is what gives pyro-soda its long range of contrasts, which, we believe, practically exceeds that of any other developer, especially if we take into consideration the variation in the color of the image which may be produced by using more or less sulphite. While mentioning sulphite it must not be forgotten that the quantity of sulphite should be in proportion to the bulk of solution used and not to the pyro present, that is to say, if a normal developer contains 16 grains per ounce of sulphite, it should, when diluted to any extent which may be desired, still contain 16 grains to the ounce, if the same immunity from stain is to be secured. This is easily done by using a plain sulphite solution of this strength instead of water only. It is a common error to attribute staining with dilute developer to the increased time of immersion, as may easily be proved by developing the halves of a cut plate for the same length of time in full strength and dilute solutions respectively. There will, of course, be a great difference in density, but the stain in the shadows will be much more marked in the part treated with the weak solution.

As with all developing, the action of pyro-soda is greatly affected by temperature, and much uneven work is caused by neglect of this point. All systems of tank development call for the use of the thermometer, but with dish development there is often a tendency to cut the operation short, under the impression that no more action can take place. This is more pronounced with some makes of plate than with others; some brands which give vigorous negatives at a temperature of 60° F. yield but thin ones, even with a much longer treatment in the same solution at 45°. If possible such low temperatures should be avoided, but if this cannot be done development must be prolonged as long as may be necessary. Density should never be judged by the appearance of the image on the back of the film. We have known plates to be rejected because, although the image appeared clearly on the back, it appeared thin after fixing. In such cases longer development will give greatly increased density.

When any considerable difference in density is required it is usually preferable to vary the strength of the solution rather than to trust to very short or very long periods of immersion. If thin images are required a developer of half normal strength will, as a rule, give more even results than short treatment with a normal solution, while to obtain a vigorous result from a flat original, one double the normal strength may be used with advantage. In the latter case it is advisable to add a little potassium bromide to prevent the appearance of chemical fog, which is liable to occur with some emulsions. When such variations in strength have to be made it is convenient to keep the pyro and soda in concentrated stock solutions, which may be of such strength, that one dram of each and six drams of water form the normal developer. A double strength solution may then be obtained by taking two drams of each and four drams of water for each ounce. This cannot be done where the ordinary practice of making up an ounce of pyro and the prescribed quantity of soda up to 80 ounces each and using without dilution; such a developer can be weakened easily enough but cannot be strengthened; moreover, such weak solutions do not retain their activity as well as those which are more concentrated.—*B. J.*

Rapid Plates and Flat Negatives

DURING the last few years the standard of speed for plates used in studio work has been steadily growing higher, and 400 H. and D. is now regarded as nothing exceptional. The old prejudice against very sensitive plates has almost ceased to exist, but there are still many operators who seem to think that although very rapid plates will yield images full of detail, they cannot be expected to give the brilliancy usually associated with slower emulsions. We do not propose to consider the scale of tones which any particular plate or plates will render correctly, as in practice any plate now on the market will fulfil all average requirements quite satisfactorily, but to indicate as far as possible the way to secure plucky results with short exposures.

It should be, but is not always, recognized that a plate which is very sensitive to the light transmitted by the lens is also highly susceptible to any other light which may happen to reach it at any stage between opening the package and fixing the negative. A very little fog frequently gives an impression of overexposure with short development and a muddy slow printing one, if carried to full density. One of the most common causes of flatness is diffused light in the camera, and it is curious that concurrently with the increase in plate sensitiveness the precautions formerly taken to avoid fog have gradually been abandoned, although they are now more than ever necessary. One of the most important of these is a shade or deep hood for the lens, which is usually absent on modern rapid lenses as well as upon most studio cameras when sold. A great many operators fix up some sort of shade for their own use, but it is rare that a really effective one is seen. A good test for any method of lens shading is the making of "Rembrandt" portraits, in which the light is shining almost directly into the lens, illuminating the inside of the tube and the surfaces of the glass as well as the bellows and woodwork of the camera. It will be found that to secure freedom from fog in these conditions it is absolutely necessary to screen the lens by means of a dark card or curtain having in it a rectangular opening which only allows the rays passing from the sitter and his immediate surroundings to reach the plate; that is to say, that if it be desired to take a cabinet portrait with a 12 x 10 camera only, an area a little larger than a half-plate should be seen upon the ground glass, the remainder being more or less vignetted off. As no light reaches the sides of the camera the color of the interior of the bellows does not greatly matter, but it is advisable to give a coat of dead black occasionally, instead of tolerating the medium gray tone which most bellows assume with long use.

A very slight cloudiness on the surfaces of the lens will cause a considerable amount of fog upon the negative, and as it is not advisable to wipe the surfaces too often, both front and back surfaces should be protected by caps or other coverings when not actually in use. During the recent foggy weather a single day's exposure to the atmosphere would be enough to dim almost any lens, yet many are left for weeks at a time with only an occasional polish to the front surface. Now that caps are seldom used the lens is usually freely exposed to light and fog, and it will be as well to remember that much of the glass which has been used in the manufacture of rapid anastigmats is far more susceptible to the action of light than the old flint and crown of the Petzval portrait lenses.

Fogging caused by unsafe illumination in the dark-room is easily recognized, as it extends over the margin protected by the rebate of the slide, while with camera fog the margins are clear. A light which may be "safe" with a 200 H. and D. plate, which attains proper density in two and a half minutes, may be very risky with a 400 H. and D., which requires double the time in the developer to yield the same strength of negative.

Thinness of image, which gives an impression of flatness, often results from insufficient development when using very rapid plates. A very simple experiment will prove whether a plate is capable of giving a sufficiently plucky image. Two plates of similar make should be developed in the same dish, one for the time usually allowed and the other for twice as long, without reference to its appearance. In most cases the difference in contrast will be very noticeable. Referring to this, we may instance a recent test where twelve plates having received identical exposures were distributed among the members of a small society for development and subsequent comparison. The results ran the whole gamut, from a thin image full of detail but incapable of giving even a decent gas-light print, to a strong contrasty one which required treatment with persulphate before it could be used even for carbon. Each member had treated the plate by methods which had, with other brands, given him satisfactory results.

Rapid plates are naturally most in demand in the winter; or perhaps we should say that it is usually in winter that the change from a medium to an extra rapid plate is made, and it is at this time of the year that there is the greatest amount of suspended matter or fog in the atmosphere. The eye becomes so accustomed to it that its presence is hardly realized, but it is none the less there, degrading the shadows on the photograph. If we protect a beam of light from a magic lantern or even a pocket torch in an otherwise darkened room, we can see the suspended particles in the form of haze, for in clear air the path of the rays cannot be traced. It is therefore important that the space between the lens and the sitter should not be illuminated more than is absolutely necessary, expecially when working with artificial light, and for the same reason the lens should be of no greater focal length than is absolutely necessary. A rough method of estimating the amount of fog in the studio is to place a crumpled black velvet cloth in the position usually occupied by the sitter. Then, standing by the camera, hold up a similar cloth a few inches from the eye so that the edge cuts across the distant velvet. It will be found that the deepest shadows on the latter are more or less gray and the effect of screening off intervening light can readily be seen. Only after all the foregoing precautions have been taken can we accuse rapid plates of giving flat negatives.—*B. J.*

Beginners' Difficulties in Bromide Enlarging

It has fallen to the writer on many occasions to give instruction and advice to persons taking up bromide enlarging both among professional and amateur photographers. The difficulties experienced and the character of the unsuccessful results often obtained at first are almost always alike, so that a few hints regarding these may be acceptable to some who are commencing in this branch of photography. A perusal of these notes may save such a good deal of the disappointment and waste often occurring.

The difficulties referred to are quite few, and it is not proposed to enter into the hundred-and-one details of process and apparatus, as these ar well covered in several shilling manuals on the subject. The two principal troubles met with are: Firstly, flat results, which will not compare in quality with contact prints from the same negatives; and, secondly, a want of evenness of the illumination on the easel, which will probably show itself in the enlargement, especially in the case of groups which would in that state of affairs come out with some of the faces noticeably lighter or darker than they should be.

There are a few other difficulties which may be found troublesome and puzzling when they occur to the uninitiated, but which are quite easily overcome. These minor troubles are: blisters, white specks in lines or groups, and a doubled image.

Taking each of these points separately, a flat-looking result may be caused by fog—that is, by light other than that forming the image acting on the paper. If this should be the case no part of the sheet will be white, and the most probable cause would be an unsafe dark-room lamp. Bromide papers can be handled, of course, in a much brighter light than plates, and in most cases two thicknesses of "Canary fabric" should suffice to make the light safe. There should be as bright a light as possible consistent with safety, so as to see the development of the prints with comfort and ease. To test the safety of the light place a small strip of bromide paper at about two feet from the lamp with a coin or other opaque object lying on the sensitive side. Leave it exposed to the light for two minutes and then place it in the developer for the same length of time, and if an outline of the object can be seen another thickness of the yellow fabric should be placed over the light.

If an "M. Q." (metol and hydroquinone) developer be used, its temperature should not be allowed to fall below 60° F., as the hydroquinone will then not work properly and weak images only will result. The best temperature for the developer of whatever variety is about 65° F. Stale paper is occasionally the cause of poor results, and care should be taken to obtain supplies from a reliable source, and if a reasonable doubt be entertained that faulty results are due to bad paper a piece or two should be sent to the manufacturer along with one of the spoilt prints and the outside wrapper bearing the "batch number."

The most usual cause, however, of flat enlargements is overexposure, coupled with under-development. A good average bright negative should be chosen, such as will give a nice contact print in any ordinary process, and placed in the lantern to make the first attempts. Having focussed the image, a few strips of bromide paper should be cut to avoid wasting whole sheets, say about 6 in. x 1½ in., and one of them pinned up and exposed. No guide can be given, as lights, negatives, and papers vary enormously, and so in each installation the first one or two trial exposures can only be done by guesswork. The trial strip should include a bit of the densest part of the negative in which detail is wanted and a bit of the thinnest, as well as some shades in between. After exposure, the strip is placed in a dish of developer, which is kept gently moving. The image should come up gradually and take not less than one minute, but one and a half to two minutes would be better. If the lightest detail comes up before one minute, or if the picture grays over quickly, the exposure has been too full. On the other hand, if the picture is not at its full strength in two minutes more exposure is required. At first all "trials" should be given a good minute in the developer until one becomes able to judge from the rate at which they come up whether the exposure has been correct or not. When a good trial strip has been obtained—that is, when it has received just so much exposure that about two minutes' development produces a bright image, it should be rinsed slightly and placed in the fixing-bath and the white light turned up for confirmation.

A full sheet can then be exposed, and if developed in the same developer for the same length of time, obviously an equally satisfactory print should result. Bromide prints, especially matt-surfaced ones, will dry slightly darker and duller than when wet, and if the negatives are not of the very best, a semi-matt surface will perhaps give the greatest satisfaction at first. When developing trials it is not a bad plan to examine the strip by transmitted light—that is, holding it up so that the light shines through the paper, when development is nearly done, and if the image looks as brilliant then as it does when seen flat in the dish, it may be taken as an indication that the exposure has been correct and that the print will be a bright one.

In enlarging, as in negative-making, correct exposure is more than half the battle. The rule is to expose so as just to get the lightest details to show with thorough development. If the negative be contrasted the same rule holds, but a dilute developer can be used; while for a flat negative a few drops of potassium bromide—say one drop to each ounce—10 per cent. solution will tend to correct this, but a longer development should be aimed at. "Trials" should be made for every negative if real satisfaction is desired. Only those who are engaged in this work as a constant daily occupation can really dispense with this precaution, or those whose negatives are of remarkably even character.

The question of illumination differs as to details in each outfit, but the main points are similar. In a daylight enlarger or in one of those worked by reflected artificial lights, illumination is generally quite even if a good large surface (much larger than the negative) of reflector be provided and this must be dead white, not polished mirror or metal. Also direct light should not be allowed to reach the negative. In an enlarger fitted with a condenser the circumstances governing even illumination are somewhat more complicated. If the apparatus be set up in the dark-room with the lamp alight but with the front and lens removed a beam of light will be seen issuing from the condenser and converging more or less to a point. The distance of this point from the condenser can be varied by altering the distance of the light from the other side of the condenser. The smallest part of this cone of light should fall in the lens when in position, and as the lens has to be used at various distances according to the degree of enlargement, so also must the position of the light be altered accordingly. This movement is almost always provided for by a sliding arrangement to and fro, in addition to means for raising and lowering the light and moving it sideways.

A negative should be placed in the carrier, roughly focussed, and then removed. The lens should be stopped down slightly and the easel (which should be covered with a sheet of white paper) examined. It will then be easy to see if the lighting is even, and, if not, the light should be shifted, laterally or vertically, until the brightest part of the disk is central, and then the sliding movement brought into use until it is equally bright from center to margin. With some illuminants it is not easy to obtain a perfectly even effect with a small aperture in the lens. This can be remedied by a piece of fine ground-glass between the light and the condenser. In all up-to-date enlargers provision is made for this to be easily inserted or removed. Once the light is satisfactorily centered it should not be altered except when the rising or sliding front is used, and then the effect will be observed on examining the easel, but the sliding movement is brought into play every time any material alteration is made in the distance between the enlarger and the easel. Only by attention to the necessity of examining the illumination on the easel and adjusting the light accordingly can certain noticeable faults be prevented.

Coming now to the other troubles mentioned, blisters are caused by too great a difference in the temperatures of the various baths, especially between the fixing and the washing water. Hypo cools the water in which it is dissolved to a considerable extent, and in winter a little warm water should be added to counteract this.

White specks on matt or rough papers are due to minute air-bubbles, and show themselves when the developer is not flowed over in an even, unbroken sweep. This takes a little practice in sizes over whole-plate, so at first the print should be soaked in plain water for a minute before development, and the trouble will then never occur.

A doubled image may be caused in two ways. One way is by vibration, either by touching the apparatus, or by walking about heavily during exposure. The other cause of this defect may be that the yellow glass cap is of a light tint and allows the image to print faintly at a slight distance from the actual white image. The glass of the cap should be of a deep rich orange to prevent this occurring with a powerful light source. —*B. J.*

Home-made Transparency Plates

The suggestion by Mr. C. W. Thomas, that photographers and amateurs should themselves prepare their plates for transparencies, is one that in these times of inflated prices should meet with ready acceptance, especially by those possessed of the old experimental spirit, but, unfortunately, no full working formulæ were supplied.

I beg, therefore, to offer a formula which was published in the *Photographic News* in 1855, and which yielded transparencies of good quality, reminding one of the clear shadows of wet collodion. The formula was based on the original plan of Gaudin and Maddox, without washing, as it was intended for beginners in emulsion making.

The only real difficulty is the provision of a suitable place for drying. If the photographer is in the habit of backing his plates, he will, of course, have a suitable drying cupboard. If not, a cupboard in a dark-room may be utilized by placing a bottle of hot water in the lower part, say a foot or so below where the plate-rack is to stand, and hanging a piece of dark material inside from the top to the bottom, and close to the sides. The cupboard door may be opened occasionally to change the air when the room door and window are closed.

The formula is as follows:

Gelatin	60 gr.
Potass bromide	45 gr.
Water	2¼ oz.

Any good clean gelatin would probably serve. That which I generally used was sold in pound packets for confectionery purposes, at about 2*s.* per pound. Put the gelatin to soak in the water half an hour or so before melting. Heat to 130° F., and dissolve gelatin and bromide.

Then stir in

Silver nitrate	60 gr.
Distilled water	3 oz.

at about the same temperature. Heat to 150° F., and keep at that temperature for two hours. Then add

Gelatin	1 oz.
Water	15 oz.

The gelatin should be well swelled in the water and then melted at 150°, mixed, and well shaken with the emulsion. Add methylated spirit, 2 oz., and finally 1½ drs. of a solution of

Water	1 oz.
Chrome alum	12 gr.

If the methylated spirit should be found to fog the emulsion pure alcohol should be substituted for it. These two solutions should be of the same temperature as the emulsion, secured by standing bottles of them in the water of the boiler or basin in which the emulsion jar is standing, and are added little by little, with constant stirring or shaking. The finished emulsion should be strained, while hot, through fine muslin, nainsook, or lawn.

For coating, the emulsion should not be warmer than is necessary for it to flow smoothly over the cold plates, nor should it be kept long in the liquid state, or the plates will not be uniform in speed, and may not retain the clearness of their shadow. The plates, as coated, are laid on a levelled cold slab until the emulsion has set firmly enough for them to be put upright—not too close together—in a plate-rack to dry. As chilling slab, the glass from a large printing frame may be used. Wedges under two corners of one side and under the middle of the opposite edge are adjusted with the aid of a spirit level, so that the slab of glass is itself level.

It is not suggested that plates of this character could take the place of rapid commercial plates for studio or general use, but for transparencies, and probably for most copying work, they should prove useful. In the matter of expense, as most photographers have plenty of waste negatives that could be washed off, the cost would come out at about a halfpenny for a half-plate.

A convenient pourer for coating plates is one introduced to me by Mr. W. B. Bolton, and a leader in bromide emulsion work. It is a small Japanese teapot, with earthenware strainer, into which surplus emulsion from the coating is poured. A piece of nainsook or muslin is placed on the opening for the lid, and the earthenware strainer forced down into place.

Pyro, generally with ammonia, was the developer in use at the time, but I see no reason why the modern developers should not do very well. Mr. Matthew Whiting, expressed himself as highly pleased with the plates, and mentioned that he used his favorite potash developer for them. The developer that I used, so far as I remember, contained equal parts of pyro and bromide of potassium. I think it was 1 grain of each, and 3 minims of ammonia to the ounce.

The plates, for the best effect (as for other purposes), should be backed. The original formula for caramel, gum, and burnt sienna answers very well, and for more speedy drying the addition of a little methylated spirit, as recommended by Mr. A. Haddon, is useful.—W. E. Debenham, in *B. J.*

Dirt in the Dark-Room

A very large proportion of the questions addressed to us relate to troubles evidently caused by dirt; that is, by dust in the dark-room or dirt in the solutions or by the use of dirty dishes or measures. From what we have seen of various dark-rooms and from what we know of the care necessary to avoid dirt, we can feel no surprise. Very often measures and dishes are left uncleaned at the end of the day's work, simply because no conveniences exist for cleaning them. There is no scrubbing brush for the dishes, no mop for the measures, and often no rack where dishes can be set to drain. All these provisions should be made, while it should be a rule that all dishes must be thoroughly cleaned when done with, and Sapolio or Monkey soap should be provided for this purpose. A special shelf over the sink should be devoted to the draining of measures, beakers, etc., all of which should be left to drain upside down. For cleaning them we have found the most useful thing to be a pair of ordinary wooden glove stretchers, used to hold a sponge gripped between the ends. Bits of sponge of various sizes should be preserved for the purpose, and the stretchers will be found just as useful for small measures as for large wide-mouthed bottles. A few large sponges should always be at hand also, for nothing is better than a damp sponge for wiping down a bench top or shelf.—*B. J.*

The Stereoscopic Photography of Small Objects

The art of stereoscopic photography, as usually practised, consists (*a*) in the translation, by means of suitable optical apparatus, of a three-dimensional real object into two two-dimensional images in the same plane, and differing from each other by a certain carefully determined parallax, and (*b*) in the presentation of these images to the eyes, with or without the aid of another optical apparatus, in such a manner that they are again resolved, and retranslated into a three-dimensional visual image similar to the original. This three-dimensional image may conveniently be called the stereoscopic image, as distinct from the stereoscopic negatives, photographs or prints which are used in its formation. The two branches of the subject are of equal importance, and cannot be dealt with separately.

A. The first essential in accurate stereoscopic work is that the image formed, whether it be equal to, larger than, or smaller than the original object, should be perfectly proportioned in all its three dimensions, so that the shape of the original may be exactly reproduced, without any deformation or change.

To secure this, three conditions, and three conditions only, which are universally applicable to every branch of stereoscopic work, must be fulfilled:

1. The axes of the lenses employed in taking the negatives must be parallel.

2. The optical centers of the two photographs, as presented to the eyes (not necessarily as mounted), must be at a distance apart equal to that separating the two eyes of the observer, and exactly opposite the eyes, so that the lines connecting these centers with the eye pupils may be parallel and at right angles to the plane of the eyes.

The optical center of a photograph is the point at which the axis of the taking lens intercepts the plane of the negative. These are fixed points in stereoscopic work; and no matter what subsequent magnification or manipulation is adopted they must remain at the fixed separation just stated. The fulfilment of this condition, even approximately, is one of the most difficult problems, and in ordinary work one of the most tedious, that we have to face.

3. The prints or transparencies, as viewed, must subtend the same angle at the eye-pupils as the original object subtended at the centers of the taking lenses.

B. *Size and Distance of Stereoscopic Image.* The size (linear dimensions) and distance of the image are to a certain extent inter-connected, in that it will be convenient to decide on both beforehand and arrange to secure the required result; but any size and any distance can be obtained as the subject demands. In actual working, therefore, they are independently determined.

4. *Size of Image.* The size of the image relatively to the original depends altogether on the distance of the lens axes from each other when taking the photograph. If the image is to be actual size, the separation of the lens axes must be equal to that between the eyes of the observer; if greater, the lenses must be closer together; if less, they must be more widely separated.

The linear dimensions of the image stereoscopically seen vary with strict exactness inversely in proportion to the lens separation. This is the dominating fact in stereoscopic work.

5. *Distance of Image.* It having been determined that the image is to be at a certain distance *and* of certain size, the distance at which the object must be placed from the lens centers is found as follows: For an image of natural size, the object distance must be the same as that required in the image. For an image twice natural size, the object distance must be half that required.

In general: *For any given distance of the stereoscopic image the distance of the object from the lenses varies with strict exactness inversely in proportion to the scale on which the object is to be reproduced, or (see 4) directly as the lens separation.*

By "distance" is meant the distance between some given plane of the image or object and the plane of the eyes or the lens centers. In the photography of small objects it will be very desirable to take the background or support on which the object rests as the plane of reference. The bioptic parallax will then throw the image into relief against this plane.

Here it must be insisted on that the effect of size and position secured by the application of these rules is not an illusion or mere mental impression. The size of the image is not an apparent size; it is real. The position of the image is not an apparent position; it is a real position to which the image is projected by the perfectly normal action of the visual faculty. The mind has merely to receive and identify the data presented to it by the eyes and interpret them as experience has taught. In viewing the stereoscopic image, it is true that the eyes are focussed on a plane surface, and accommodation is not therefore called into action or completely correlated as it is in nature; but this unavoidable defect is not sufficient to disturb or confuse the mental judgment, or, when properly viewed, to produce eyestrain. Incorrect mounting of the prints and general want of precision in the work undoubtedly do produce intense fatigue in the eyes after some time.

C. *Effect of Focal Length, etc., upon the Stereoscopic Image.* The focal length of the taking lenses, the camera extension, and the scale of the negatives do not constitute three separate factors in the problem, but only one. The focal length determines the camera extension in any given case, and the camera extension determines the scale of the negative. None of these elements has any decisive influence whatever upon the size or position of the stereoscopic image or on the correctness of its perspective. The camera extension merely determines the correct distance of the eye from the plane in which the prints are mounted, if the latter are made directly from the negative, so that condition 3 may be fulfilled.

The choice of focal length is therefore entirely a matter of convenience, determined partly by the limits of optical possibility of each lens, partly by the apparatus in use, and partly by the desire to avoid subsequent alteration of scale before printing.

D. *Result of Magnification or Reduction of Negative Image.* This is *nil*, provided the resulting prints are viewed from a correspondingly greater or less distance, so that they still subtend the proper angle at the eye.

If, however, a magnified pair of stereoscopic prints is viewed from the distance of the original camera extension, *i. e.*, at too great an angle, the stereoscopic image will be brought nearer and at the same time will be foreshortened or flattened in depth. The linear dimensions will remain unaffected in planes parallel to the prints, but in planes perpendicular to the prints they will be reduced exactly in proportion to the degree of the magnification. It is extraordinarily difficult to detect this distortion, especially when the field of view is narrow and the depth of the field not great; but that is perhaps all the more reason why it should be avoided. It must be noted that no real magnification of the image is secured, but only a closer view, which in many cases could be otherwise obtained without any sacrifice of accuracy.

When a reduced pair of prints is viewed from too great a distance the reverse to the above takes place. The image is seen further off and its depth is exaggerated.

We now come to some considerations affecting the finished prints themselves. For the sake of clearness, a pair of prints ready for viewing will be called a stereoscopic slide.

E. *Method of Viewing Prints.* Before a stereoscopic slide can be prepared it is necessary to know at what distance it will be held from the eyes of the observer, in order that the correct angle of view may be maintained. If it is to be looked at without the aid of a stereoscope it will naturally be held at "the distance of distinct vision," which in practice may be standardized as 12 inches, and the size of the prints must be made to conform to a camera extension of that length. If, on the other hand, it is to be viewed through a stereoscope, the slide will be placed approximately in the focal plane of the viewing lenses, and the size of the prints must be reduced accordingly. Suppose, for instance, the original camera extension of the taking apparatus to have been 8 inches. If the slide is to be examined directly at a distance of 12 inches from the eyes the negative must be enlarged $1\frac{1}{2}$ diameters. If it is to be viewed through a stereoscope with lenses of 4-inch focus the negative scale must be reduced 2 diameters. The two slides will produce identically the same effect, but the scale of the two will differ by no less than 3 diameters.

F. *Effect of the Distance of the Stereoscopic Image upon the Process of Preparing Slides.* The distance at which the image of small objects would appear most natural is that at which the object itself would be examined if held in the hand of the observer. In this form stereoscopy reaches its highest point of perfection, as the focussing and converging accommodation of the eyes are almost exactly coördinated. Unfortunately, however, a most interesting problem arises here when it is proposed to view the slide without a stereoscope. For the plane of the mount itself will also be held at the same distance, and will coincide with the reference plane of the image. In other words, the right and left hand elements will have to be accurately superimposed upon each other on the mount by means of the selective two-color process already known, and viewed through corresponding light-filters. Or the two must be mounted side by side and shifted laterally by means of prisms or double reflecting surfaces until they optically coincide. This latter plan, involving the use of an optical apparatus, would quite annul the advantage of dispensing with an ordinary stereoscope, and would entail an inconvenient width of slide.

The two-color process referred to is one of great attractiveness, but it is very imperfectly developed. It would be of the greatest importance for the illustration of scientific books, and even of jewellers' catalogues, etc. It would allow of very large subjects, such as a group of entomological specimens, to be photographed and viewed together. There would be no secondary flat images at the right and left of the stereoscopic image to disturb the sense of reality. It could be impressed, with perfect success, on the pages of a book, in the same way as ordinary color printing. It certainly offers a most useful and promising field of investigation to specialists in transparent color inks and light-filters. Some albums of stereoscopic prints made on this method were published in Germany twelve or fifteen years ago, and were fairly satisfactory, but they were of the ordinary landscape kind which is particularly unsuitable. The only example at present in the writer's possession—a postcard—is thoroughly bad.

Failing the adoption of this process, it will be necessary to print the right and left-hand elements on a scale equivalent to a camera extension of 4 in. or 3 in., and to use a stereoscope with lenses of 4-in. or 3-in. focus in viewing. This will allow subjects of moderate width of field to be printed side by side without overlapping.

G. *Problem of the Correct Spacing of the Optical Centers.* When full-scale flat images are made, and the super-imposed process adopted, this problem disappears. In the right and left-hand elements, the images of the reference plane of the object will in this case have no parallax relatively to the mount or to each other, and must be accurately registered in exact coincidence. This makes it important that, as already suggested, the flat background on which the object rests should be taken as "object distance," and it should preferably have a clearly defined border or other markings to facilitate registration of the color blocks. The optical centers will then automatically assume their correct position.

When small scale slides are made for use in a stereoscope the following method may be employed.

On the rebates of the stereoscopic negative, or on some part of the film which will not appear on the slide, and not far from the inner edge of one of the pair of images, mark the two ends of a vertical line. On the rebates of the other image mark similarly the ends of another line parallel to the first and at a distance from it exactly equal to the lens separation used. If the negative is printed from direct, the prints, having been reversed from right to left, must be mounted with the images of these lines eye-distance apart. The separation of the optical centers will then be correct. This does not quite obviate trouble, as the marks will have to be trimmed away before mounting, unless they are left on and subsequently masked out.

A better way is to use a copying apparatus fitted with two twin lenses on a sliding panel, the lenses being also separately mounted on sliding panels capable of fine adjustment from the side. Having adjusted the extension between negative, copying lenses, and focussing screen to give a sharp copy on the required scale, the lenses are moved relatively to each other until the vertical marks on the rebates appear eye-separation apart on the screen. A print or transparency may then be made having the two images reversed, in correct position for viewing, and with the optical centers properly spaced.

This method can only be adopted for making the small scale slides already referred to adapted for use in a stereoscope. If the scale is too large, the images on the focussing screen will overlap. If the scale is the full size of the required stereoscopic image the two will coincide and be superimposed.

Another method of correctly spacing the prints is described in Section H below.

H. *Width of Stereoscopic Image.* It is of the utmost importance to the practical worker, in order that he may not attempt what will prove to be impossible, that he should know the extreme width of the stereoscopic image obtainable under any given viewing conditions, or, in other words, the extreme width of print that will not involve overlapping if the slide is to be examined in a 4-in. or 3-in. stereoscope. (The height of the image does not enter into the problems dealt with here, as this is determined solely by the covering power of the stereoscope lenses, and by the general inconvenience of looking at objects at such an angle that the eyes are unduly elevated or depressed from the horizontal.)

The following considerations give a simple way of arriving at these important facts, and they also suggest an alternative method of correctly spacing the prints by direct calculation based on the distance of the stereoscopic image.

When the eyes converge upon any two corresponding points of the right and left-hand elements of the slide, the lines of convergence meet in a point of the stereoscopic image, and this point of meeting determines the distance of the image at this point from the plane of the eyes. If now we imagine for a moment the image to be a real object, and the slide to be merely a transparent plane capable of being moved to and fro between the eyes and the object, it is clear that these converging lines, from eyes to object, will cut the plane in points which increase their distance from each other as the plane approaches the eyes, and draw nearer together as the plane is moved in the opposite direction; until, when the plane touches the object, the two points will coincide. This last is the condition which necessitates the super-imposing of the right and left-hand elements. At any given distance of the plane from the eyes, the separation of corresponding points gives the extreme width of print possible without overlapping; and it also obviously gives the correct distance at which corresponding points of the right and left-hand prints should be mounted.

This distance, and its result upon the limitation of the stereoscopic image, can easily be calculated. For if the slide is to be viewed at 4 in. from the eyes (in a 4-in. stereoscope), and the plane of the image is to be 12 in. distant, then the separation of corresponding points will be 8-12 of eye-separation, or 1.5 in. Taking, therefore, the flat background, with well-defined border line, as "object distance," it will only be necessary to trim the prints to shape and mount them with the images of this border line 1.5 in. apart to secure exact spacing. Again, since the slide is 4 in. from the eye, and the image 12 in., the scale of the prints will be one-third that of the image, and the extreme width possible to an image at a distance of 12 in. seen through a 4-in. stereoscope is therefore 3 x 1½ in., or 4½ in.

An important advantage attaches to the use of a 3-in. stereoscope. In this case, taking image distance as before, the separation of corresponding points in the prints will be 9-12 of eye distance, or 1.69 in.; the scale of the prints will be reduced to one-quarter that of image, and the latter can have an extreme width of 6.75 in., or half as much again as that possible with a 4-in. stereoscope.

In each case, as a slight separation should be left between the inner edges of the two prints on the slide, the actual width of print and of image will be somewhat less than the extreme width indicated.

The advantage of the shorter focus stereoscope remains when the stereoscopic image is to be distant at more than 12 in. from the eyes. For instance, a butterfly of 12-in. wing-spread can easily be reproduced natural size at 2 ft. distance with a 3-in. stereoscope. The extreme width of print, or separation of corresponding points, will in this case be seven-eighth eye-separation (taken as 2.33 in. at 2 ft.), or 2.04 in., and the extreme width of the image will be eight times this, or something over 16 in.

In general, if D represents image distance, d distance of slide from the eyes (focus of stereoscope), and S eye-separation, then: Separation of corresponding points on slide $= \frac{D-d}{D} S$.

Extreme width of image $= \frac{D-d}{d} S$.

If the copying apparatus described in section G is used for making the slides, the images on the focussing screen may simply be adjusted until corresponding points are covered by the ends of a compass set at the correct distance apart as calculated. The rebate marks on the negative are then unnecessary, but might be used as a second test of accuracy.

The image distance must be calculated with reference to some given reference plane in the object, and the corresponding points of the slide whose separation is measured must lie on the images of this reference plane; they must not be taken at random from other planes, as the separation varies for each plane.

The eye-separation, which varies with convergence, must be estimated from the distance of the image, *not* from that of the object photographed. The writer is not competent to give exact average figures, but workers are referred to the very instructive letter on the subject which appeared in the correspondence column of this journal on December 19 of last year. The "personal equation," or difference of individual eye-separation from the normal, will always remain to give a little uncertainty to the result; but, unless in very extreme cases, its effects will be inappreciable.

Two optical tables may be added here. The first illustrates the simple relationship that exists between lens-separation, size and distance of stereoscopic image, and distance of object from the taking lenses. The second gives some examples of the way in which the negatives may be obtained.

TABLE I

Lens-separation as compared with eye-separation	4	2	1	½	¼	$\frac{1}{x}$
Size of stereoscopic image as compared with object .	¼	½	1	2	4	x
Distance of image as compared with that of object	¼	½	1	2	4	x

TABLE II

Measurements in inches.

Distance of stereoscopic image . .	12	12	12	12	12
Size of image compared with object	1	2	3	4	10
Distance of object from lens . .	12	6	4	3	1.2
Focal length of lenses .	6	4	3	2.4	1
Lens-separation . .	2.25	1.12	0.75	0.56	0.225
Camera extension .	12	12	12	12	6

(The eye-separation in viewing near objects probably does not average more than 2.25 in.)

In Table II the standard distance of 12 in, is adopted for the stereoscopic image, and a fixed camera extension of 12 in. is secured in the first four examples, the results being thus directly adapted for the superimposed process. Since the image distance and camera extension are the same, the size of the negative image should be identical with that of the required stereoscopic image, as given in the second line of the table. The fact that this is so in the examples before us is pleasing evidence that the conclusions arrived at in this article do not lead us astray. The example on the extreme right shows how a magnification of 10 diameters may be secured, retaining the position of the image at the required standard distance of 12 in.—H. C. Browne, in *B. J.*

Detecting Pinholes in Camera Bellows

When a camera, either of the field or studio pattern, "springs a leak" most assistants I find start to locate the trouble by turning back the focussing screen, burying the head in the focussing cloth, and endeavoring to discover where light is getting into the camera. But a much easier method is to work the other way about, that is to put an electric light bulb inside the camera and then, in a darkroom, examine the outside of the apparatus for any escaping ray of light. The lamp can be conveniently fixed in the camera by cutting a piece of cardboard to slide into the grooves for the dark-slide and cutting in this a slit through which a plug to fit an ordinary electric lamp holder can be passed. This excludes practically the whole of the light, but the focussing cloth can be thrown over as well to make certain of the complete exclusion of light from the room. If this is done the slightest escape of light from pinholes in the bellows or from the lens panels can be very quickly detected. Where electric supply is not available the same method can be carried out by using one of the small pocket electric battery lamps.—E. S. Gwyer in *B. J. of P.*

Paper Negatives

As many of my readers doubtless know, paper was the material first used in the making of photographic negatives, and, strangely enough, after the glass collodion negative had firmly established itself and photographers had forgotten the difficulties of the paper negative, experimenters strove to resuscitate a flexible support for the sensitive coating. Of these, as everyone now knows, celluloid film is the only one which is as effective as a glass plate. In devoting a chaper to the making of paper negatives, I am far from suggesting that any negative of this kind is of usefulness in a regular way. The lesser sensitiveness of emulsion which is obtainable on paper, the grain of the paper itself, and the opacity of the finished negative are three positive drawbacks to the use in these days of gelatine emulsion on paper. Nevertheless, there are circumstances which can easily arise in the experience of any photographer where a paper negative answers the purpose as well as one on glass, and where the slower speed and slight grain of a bromide or negative paper are of negligible importance. Photographers have often to undertake cheap copying work for which a paper negative answers quite satisfactorily, and at a cost of material which may be a third or a quarter that of glass plates. Therefore, some notes on the making of paper negatives may not be out of place in this series of chapters.

The Sensitive Paper

This much by way of apology; let me say that choice can be made between the negative papers specially made for negative work and one or other of the many varieties of bromide paper upon the market. One or two makers issue a negative paper the chief feature of which is the tough and fine character of the paper itself and the sensitiveness of the emulsion in comparison with the average speed of a bromide paper. On the other hand, such negative paper requires particularly careful handling in use, and this chiefly in the direction of avoiding bending or buckling it when handling it in the various baths. The paper can easily be kinked; with the result that the emulsion film is very liable to blister at the point of damage. Generally speaking, practical requirements which are satisfied by a paper negative will be equally satisfied by one made on bromide paper. This latter is preferably one of the glossy or semi-glossy kind, although among the extremely fine matt papers now on the market it is not difficult to pick out some which answers well for negatives. Naturally a thin paper requires to be chosen; the paper negative is opaque at the best, and though it can be rendered somewhat more transparent by oiling or waxing, either of these are messy processes, and to be avoided if possible. They are of doubtful value in reducing the grain of the negative, and any effect which they produce in increasing the speed of printing can just as easily be obtained by using a more powerful source of light when printing (as would usually be done) on bromide paper.

Exposure, Development, and Fixing

A paper negative, of course, requires to be exposed in dark slide of book form, being backed up against the rebate of the slide by a piece of stout card. By this means alone sheets up to half-plate, at least, can be readily obtained perfectly flat in the field of the lens. It must be borne in mind that, compared with modern high-speed plates, any bromide paper is quite slow, and exposures will require to be ten to twenty times those which would be given to the average extra-rapid plate.

In development the chief thing is to avoid too rapid development. The superficial image which is readily obtained on bromide paper is not of sufficient intensity for a paper negative. One requires to develop further, judging the result by examining the negative by light coming through the paper. Perhaps as good a developer as any is metol-hydroquinine of formula such as is generally used for bromide papers, but with an extra dose of bromide. Hydroquinone made up with carbonate of soda is another good developer for this purpose, and pyro-soda can equally be used so long as a liberal proportion of sulphite is employed, say, five times the weight of the pyro in the stock solution.

As regards the fixing bath, this latter should preferably be one of the acid type, one of the best formulæ for which is hypo, 4 ozs., dissolved in 20 ozs. of water, with addition of ½ oz. of potass. metabisulphite.

Printing

Little requires to be said on this head beyond the fact that the grain in the paper negative, which is always present to a greater or less extent, requires to be masked as far as possible in the print. For this reason it will not do to print from the negatives on glossy paper. The effect of the grain thus recorded on the glazed surface of the print is particularly objectionable, but a matt paper—even one without any positive coarseness of texture—serves effectively to mask this appearance. The exposure in printing requires, as I have said, to be considerably greater than that for a glass negative, but in these days of gaslight printing when bunches of lamps are regularly used for short exposures on this class of paper, the rapid taking off of bromide prints from paper negatives presents no difficulties. The opacity of the paper can, as I have said, be reduced by oiling or waxing. A number of methods for these processes have been recommended, among which, perhaps, the simplest is to apply with a brush a mixture of castor oil, 1 oz., and alcohol, 4 ozs., to the paper side of the negative, and allow a few hours for it to soak in, re-applying, if necessary, and then laying the print for a short time between blotters. Another method is to float the negative, film up, on paraffin or white beeswax kept fluid by standing the dish containing it in another of boiling water. For my own part, I prefer to dispense with these operations.

Enlarged Negatives

The advantage of bromide paper in negative making is particularly marked in preparing enlarged negatives. Here the convenience of being able to cut your paper according to the size of negative required, and at the same time to avoid the weight and cost of large glass negatives, is a very positive advantage. An earlier article in this series has dealt with the methods of making enlarged negatives through the intermediary of either a contact transparency or through one of the full size of the enlarged negative. Whichever of these is used, the bromide paper will often usefully serve for the making of the enlarged negative, particularly when the prints to be taken therefrom are to be made on a paper or by a process yielding somewhat coarsely textured prints. As regards gradation, the enlarged paper negative must be expected to yield results slightly inferior to those obtained on a dry-plate, but for many of the purposes of the enlarger the paper negative is capable of rendering satisfactory results.

—*B. J.*

Photographic Materials and Processes

Photographic sulphur toning. R. Namias. *Il Progressio Photographico,* July, 1914. *Bull. Soc. Franç. Phot.,* 1919, 6, 305. *Selenium toning process of Namias.* J. Dubreton. *Bull Soc. Franç. Phot.,* 1919, 6, 306.

CRYSTALLIZED sodium sulphide (60 gms.) and selenium powder (3 gms.), in the commercial form of small brownish-black sticks, are heated together in a porcelain crucible, with thorough stirring. After cooling, the mass is treated with water (1 liter), a deep red transparent solution being obtained which keeps well in full stoppered bottles. This bath gives with bleached bromide prints a fine purple-brown tone similar to that of a gold-toned print-out paper, with no tendency to the disagreeable yellowish appearance often obtained with the usual sulphide toning methods. Pure whites are obtained unless too many prints are treated in one bath.

Light filters; Ultra-violet transparent ——. A. Miethe and E. Stenger. Z. wiss. Phot., 1919, 19, 57—68.

TARTRAZINE in solutions 1:1000—1:20,000 shows a maximum transparency from 300—308$\mu\mu$ in the most concentrated solution to 280—391$\mu\mu$ in the most dilute. Filter Yellow in the same concentrations has a maximum transparency 296—308$\mu\mu$ with the most concentrated solutions, which increases to 270—500$\mu\mu$ with the most dilute. Martius' Yellow in 1:1000 solution is transparent for wave lengths 321—330$\mu\mu$ and in 1:20,000 solution for 296—374$\mu\mu$. Nitrosodimethylaniline is transparent in 1:90,000 solution over the range 299—365$\mu\mu$. Fluorescein increases in transparency down to 260$\mu\mu$ with increasing dilution. Eosin in 1:1000 is transparent, 368—390$\mu\mu$, and in 1:10,000, 271—470$\mu\mu$. The quartz silver mirror is transparent over the range 308—330$\mu\mu$ with a 2 seconds exposure of an iron-carbon arc, while with 640 seconds exposure the transparency is over the range 302—388$\mu\mu$.

Photographic development under tropical conditions. A. J. Agnew. Phot. J., 1920, 60, 120—122.

THE sensitive film, before development, is treated in a hardening solution containing formalin and a suitable salt (Eng. Pat. 128,377; this J., 1919, 602 A). The most useful salts are sodium acetate, borate, bicarbonate, chromate, citrate, oxalate, phosphate, sulphate, and tartrate; potassium and magnesium salts are not quite so effective, and ammonium salts are not generally suitable because of the possibility of the liberation of ammonia in development. The hardening process also reduces the rate of development and the tendency to fog, so that development is easier of control than is otherwise the case at high temperatures. Subsequent intensification and reduction processes are not interfered with. There has not been noticed any tendency to separation of the film from the glass after drying. No reticulation is produced after the hardening process, by considerable variation in the temperatures of developer, fixing bath, and washing water.

ol.57. No. 10 October 1920 20 Cents

The Photographic Journal

of America

OCT 6 1920
National Museum

Published Monthly
With Illustrations

ANSCO

5 x 7

PRINTING MACHINE

Price: $10

This Ansco Printer takes the bother out of printing. The amateur photographer who uses it gets more uniform results, more conveniently, and in shorter time. It makes printing sure and simple in any kind of room that has electric current. It is especially well adapted to the requirements of the commercial photo-finisher.

DETAILS: Takes negatives up to 5 x 7; has ruby glow and uses a standard 40-watt Mazda lamp as the printing light; lower window provides orange light for developing prints, and ruby safe light for developing plates and films.

Built with the same care for essential *rightness* that has made Ansco cameras famous.

Ansco Company

Binghamton, N. Y.

THE PHOTOGRAPHIC JOURNAL *of* AMERICA

REGISTERED IN THE UNITED STATES PATENT OFFICE

NEW SERIES: WILSON'S PHOTOGRAPHIC MAGAZINE

AN ILLUSTRATED MONTHLY DEVOTED TO THE SCIENCE AND ART OF PHOTOGRAPHY

THE OLDEST PHOTOGRAPHIC MAGAZINE IN AMERICA
Founded 1864

Incorporating:
The Philadelphia Photographer The Photographic World

THOMAS COKE WATKINS, Editor

CONTENTS FOR OCTOBER, 1920

Comparisons in Portraiture . . . . . A. W. B. 375
Carbon Printing for Professionals . . . . . A Practical Printer 377
Notes on Child Portraiture . . . . . John A. Tennant 379
Editor's Table—Dark Backgrounds and Simplicity—On Advertising 382
The Studio—Practical Papers on Studio Work and Methods 384
Views and Reviews 392
The Workroom 395

YEARLY SUBSCRIPTION, in advance, postage paid, United States, Mexico, Cuba, Philippines and Porto Rico, $2.00; Canada, $2.35. Countries in the Postal Union, $2.75. Single copies, 20 cents.

REMITTANCES may be made at our risk by money order, check, draft, or registered letter.

SUBSCRIPTIONS begin with current issue.

Published by EDWARD L. WILSON COMPANY, INC.,
THOS. C. WATKINS, President. 701 Arch Street, Philadelphia, Pa.
EXECUTIVE and EDITORIAL OFFICES, CAMERA BUILDING, 122 EAST 25th ST., NEW YORK CITY
HOUGHTON'S, Ltd., London, Eng., Agents for Great Britain
American News Co., Distributors for U. S. Kodak Australasia Ltd., Sydney, Agents for Australia
RICHARD HILL, Devonport, Auckland, Agent for New Zealand

Entered at Philadelphia Post-office as Second-class Matter

This is one of a series of sketches on Leading American Photographers

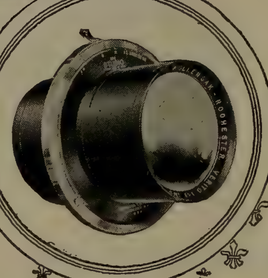
American Photographers

J. ANTHONY BILL: Friends, meet Mr. Bill, former President of the Ohio Society of Photography and of the Cincinnati Photographers.

When one sees the uniformly beautiful quality of results that Mr. Bill is securing in his portraiture, it is not surprising to learn that he has won Salon Honors for six consecutive years; that he has received a Daguerre Certificate of Distinction; that he has captured cups and other honors.

While J. Anthony Bill finds our Series II Velostigmat F:4.5 indispensable for his groups and home portraits he employs the Verito for most of his studio work. In fact, all but one of his prize winning prints were made with this lens. "There is a growing demand for these soft pleasing pictures from the men as well as the ladies", writes Mr. Bill, "and the Verito practically does away with retouching."

This big-leaguer from the home town of the Cincinnati "Reds" says, "I would consider my equipment incomplete without Wollensak lenses." We are inclined to agree with him.



Mr. Bill and his customers like Verito quality because it is pleasingly soft without being too "fuzzy." The lens is speedy, convertible, free from double lines, and reduces retouching at least 50%.

WOLLENSAK OPTICAL CO.

ROCHESTER, NEW YORK.

MERCK'S

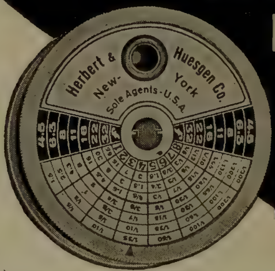
PHOTOGRAPHIC CHEMICALS

PHOTOL, Rapid Developer
(Monomethyl-Paramido-Phenol-Sulphate)

PYROGALLIC ACID
HYDROQUINONE
SODIUM HYPOSULPHITE
SODIUM SULPHITE
SODIUM SULPHIDE
POTASSIUM BROMIDE
POTASSIUM FERRICYANIDE
SILVER SALTS
URANIUM SALTS
BICHROMATES
ALUMS ACETIC ACID, Etc.

Sole Distributors of
METOL
for Rhodia Chemical Co.

MERCK & CO.
NEW YORK
ST. LOUIS MONTREAL
Works at RAHWAY, N. J.



HEYDE'S ACTINO PHOTO-METER

Eliminates Guessing in Photography!!

The simplest, most effective and most accurate instrument for determining correct time for exposure.

Easily and quickly manipulated; compact and always ready for use.

No Sensitive Paper Used For Tinting

Exposure table complete on dial.

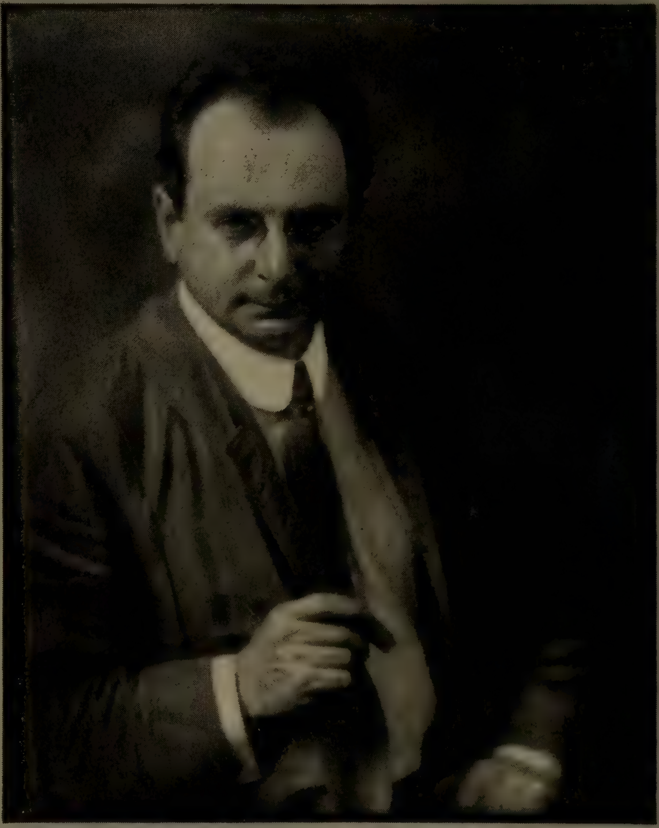
Essential to the Photographer who wants perfect pictures.

Order by mail or from your dealer. Write for descriptive booklet.

New Vest Pocket Model
Size Dia. 2-3/8" x 13/16" Thick
Price $10.

Dealers: A postal will bring our special offer.

HERBERT & HUESGEN CO.
18 East 42nd. Street
NEAR 5TH AVE., NEW YORK



ELIAS GOLDENSKY
PHILADELPHIA, PA.

The
PHOTOGRAPHIC
· JOURNAL ·
· of AMERICA ·

VOLUME LVII OCTOBER, 1920 NUMBER 10

THE AUTHORITY FOR THE PROFESSIONAL PHOTOGRAPHER
PJ A
FOUNDED 1864

Smithsonian Institution
OCT 6 1920
National Museum

COMPARISONS IN PORTRAITURE

By A. W. B.

THE ordinary method of the present-day professional seems to consist of a complete suppression of non-essentials. He uses a background so delicately tinted that it cannot possibly suggest clouds, and takes the head and shoulders only. Generally, he makes a vignetted picture; but even if he does not, all he has in his portrait of a man besides the face is the collar, necktie, and a few square inches of coat. With women, many photographers get rid of still more of the non-essential. By taking a lady in a low-necked dress and hiding the bodice with an abundance of chiffon, the shoulders appear to rise out of a mass of airy material which is even less likely to obtrude than the simplest of dresses.

As a portrait, a picture in which it is recognized that the face is the thing and nothing is allowed even the remotest chance of taking the attention from it, the modern vignette is perfect, and yet—Let us look at the old-fashioned portrait again for a few minutes, forgetting its many faults. This may be said for it: It conveys the sitter as he was, or as he wished to appear. There is something of his character in the punctilious neatness of his attire, and his curious, upright attitude—although the latter is partly due, doubtless, to an uncomfortable head rest. And, again, if we could persuade ourselves that the portrait was taken in his own home, we might take it as giving some inkling of the style in which he lived. This much may be said for the early photograph: It conveys more to us than the vignettes of today will to those who look at them forty years hence. The older picture has atmosphere (in the artistic, not the scientific sense); but unfortunately it is porduced by false and elaborate arrangements of the photographer, instead of being the natural surroundings of the sitter.

This comparison brings us to what I choose to call the newest school of portrait photographers—those who attempt to convey more of their sitters than mere outer lineaments, or to add some charm to their pictures beyond that of straightforward portraits.

There are photographers, women, many of them, who have made successes for themselves by catching child subjects in their brightest moments, by adding the charm of innocence and happiness to little faces that the ordinary worker would portray looking serious and perhaps even frightened. And with women, too, the new photographer contrives, partly by carefully chosen methods of lighting, partly by some magnetic gift in managing the sitter, to produce a portrait with all the charms of the original, and perhaps a little more.

But it is with men that the new photographer finds the greatest scope, posing, lighting and managing them to get, not the usual faint, meaningless smile, but an expression which conveys something of the sitter's character. It may be said at once that the photographer who can do these things is born, not made. His work is not to be seen in abundance in the windows of even the best professional photographers, though here and there one sees a portrait that appears to have been taken in the best possible way.

The best portraits to be seen are often those of actors, possibly because these sitters are masters of pose and expression. Let me quote one or two examples which are to be seen everywhere on picture postcards. There is a portrait of the bright mercurial comedian who skips about the stage like a schoolboy. This photograph is a full-face, in perfect focus; the face appears to be thrust forward a little, the eyes are wide open and staring straight out of the picture, while the lips are slightly parted, as though the sitter were about to speak. Another example is of a famous tragedian, whose forte appears to lie in the direction of sorrow and self-renunciation. In this case the profile has been taken with the head thrown back a little; the face is slightly out of focus; the background very dark: all which help the expression of dreamy sadness which the actor has assumed.

In portraying women and children, then, the aim should be to get into the picture the charm which is natural to the sex or age of the sitter, and which, incidentally, may be wanting or not in evidence in the particular subject with which one has to deal. With men sitters the object is slightly different—one wants character, not charm. It has been said of Shakespeare that he has no heroes, only heroines; it would perhaps be more correct to say that, with one or two exceptions, his women are charming pictures, but his men are exquisitely accurate portraits. To return to photography, it may be said that an ideal portrait of a man may or may not be in very sharp focus, according to the subject, but the ideal portrait of a woman is never really sharp.

Take a keen business man in sharp focus, thus giving his face an appearance of alertness; but if you have to deal with the reflective face of a student, it would probably be better slightly out of focus. Take an old man with all his wrinkles, and a young woman with none of hers. Avoid accessories that convey a wrong impression.

Often the subject is against the would-be truthful and artistic photographer in his desire to produce the right thing. You find a gardener or a ploughman at his work, and he is so typical and picturesque that you suggest photographing him, whereupon he immediately regrets that he is not wearing his Sunday clothes. In them he believes he looks something like a gentleman, and he would rather appear as a counterfeit gentleman than as a genuine gardener or ploughman. So with children. You meet a little girl with tousled hair and disordered pinafore, a charming picture of happy romping, child-like carelessness, and, as she is, a delightful subject. But you will get no picture worth having if the mother is anywhere near. She will insist on combing the dishevelled hair and straightening the pinafore, or perhaps, worse still, replacing it with a clean one. She cares nothing for the natural state of things; her ideal (for show purposes, at any rate) is an unnaturally clean and uncomfortably tidy child.

CARBON PRINTING FOR PROFESSIONALS

By A PRACTICAL PRINTER

Enlargements

THERE is nothing to compare with a carbon enlargement, and owing to their wondrous beauty they appeal to the customer at the first glance. I believe it is well to have a number of them, suitably framed, in the place of honor in every studio where carbon work is practiced. As carbon is not sensitive enough to enlarge directly upon, we first make a carbon transparency from a well-finished negative and from this make an enlargement in the camera. For wealth of detail and perfect gradations in tones there can be none too much praise given the carbon transparency, hence it is fit and proper to make the positive to enlarge from in carbon. All who make enlarged negatives even for other than carbon work would do well to make the positive in carbon. For this purpose a special tissue, transparency black, is used. It differs from the ordinary tissue only in being made of a very much more finely ground pigment and costs a trifle more.

The print is made as for single transfer, is squeegeed on a plain glass coated with the waxing solution, or albumen, and save that it is printed considerably deeper than it would be for a print, differs in no way from the ordinary work. When dry it may be varnished, and after the enlarged negative has been made from it, it may be used as a window transparency.

With the special transparency black, lantern slides of the choicest quality are readily made, and providing the negatives are small enough to admit of contact printing, the process is as cheap and easy as any other. I usually coat the glasses with albumen solution, dipping them wholly in and racking to dry, as it is difficult to tell which side is albumenized, and dipping is quite handy. A solution of the white of one egg, well shaken, in eight ounces of water, with a drop of strong ammonia added, answers profitably. By adding a little formalin the albumen solution might be made to keep, but it is probably better to make it fresh twice a week. The glasses being dry, the prints all made, I wet the latter and squeegee or roll them on to glasses, laying all in a pile and placing a blotter of the right size between each slide. On each pile of twenty-five a weight should be placed, and if one is doing a hundred or so, by the time the last pile is made the first lot is ready to develop. If one has a washing tank of sufficient capacity it will do nicely for developing. If not, a wire cage can be made which will hold the requisite number. About four with a capacity of twenty-five each will be convenient for the average worker. Whatever form is used, it had best be something that will hold the slides vertically. Fill the tank or cage with slides, immerse it in water at about 100° F. and leave the slides there until the backing shows signs of being ready to drop away. Then by gently raising and lowering the cage the paper slips off and the pigment begins to rapidly leave the plate where it is soluble. Changing the water a number of times and raising and lowering the cages, we soon have as fine a lot of slides as ever were made. After the soluble pigment is all washed away, a few minutes' immersion in alum water and a final rinsing complete the work. The fact that the slides are reversed makes no difference, as it is only a matter of placing the thumb mark accordingly on the finished slide. I do not varnish the slides at all, simply matting and binding a cover closely down on each slide. Slides made from transparency black will stand oxyhydrogen or electric light, but the colors of the ordinary tissue are not ground sufficiently fine. They are all that could be desired for oil lanterns and form a most agreeable change from black and white, but, as stated, they will not be satisfactory with a light stronger than oil.

Making

While such excellent papers are to be had at reasonable price from the stock house, I do not suppose any would care to make their own unless it might be the single and double transfer paper. However, for the benefit of those who would like to experiment, I append a formula for making tissue as well as those for single and double transfer paper, etc.:

CARBON TISSUE

Coignet's gold label gelatin .	2 ounces
White loaf sugar	3 ounces
Water, hot	40 ounces
Coloring matter . . .	to suit

Grind up the color with a little of the warm jelly and add to the bulk, which may be kept liquid in a water-bath. Test from time to time by floating a strip of white paper on it and look through it at the gas jet. If the flame can be seen, add more and more color until it cannot. To coat the paper, moisten it slightly and lay it on a sheet of glass, then pour on sufficient of the jelly to coat it amply and level it while setting, after which it may be hung up to dry. Windsor and Newton's moist water colors are almost all suitable for this work; sepia, Indian red, black, and some of the browns being excellent.

SINGLE TRANSFER

A

Nelson's No. 1 gelatin .	1 ounce
Water	20 ounces

Dissolve in water bath.

B

Chrome alum	20 grains
Water	2 ounces

When A and B are thoroughly dissolved, add B to A in very small quantities at a time, stirring vigorously during the whole mixing. Apply to any paper desired, or to metal, canvas or wood.

DOUBLE TRANSFER

A

Nelson's hard gleatin . .	1 ounce
Water	8 ounces

Dissolve in water-bath.

B

Chrome alum	30 grains
Water	1 ounce

Add 3 drams of B solution in 2 ounces of water to the entire quantity of A, stirring as it is added little by little. Then float the paper selected on this solution.

WAXING SOLUTION

Yellow beeswax . . .	2 drams
Benzole	1 ounce

When dissolved add

Ether	1 ounce
Alcohol	1 ounce

ANOTHER

1

Benzole	1 ounce
Beeswax	3 grains

2

Turpentine	1 ounce
Resin	12 grains

Dissolve separately and mix the two. Pour a little on a flannel rag and rub the surface to be waxed, well polishing with a dry flannel rag.

NOTES ON CHILD PORTRAITURE

By JOHN A. TENNANT

IN the treatment of a single childish figure we have an infinite variety of effects from which to choose. Simplicity will most often be the keynote to success, whether we photograph the child alone or with an accessory of some sort. Among a number of prints received from Japan were several studies of a child arranging flowers and sprays of budding plants in vases. The combination impressed me as a peculiarly happy one, and its mention suggests a line of work wherein many novel and interesting effects may be obtained. The draperies need careful attention in pictures of this sort. Our endeavor should be to avoid stiffness in arrangement, and to reproduce something of texture and detail, instead of the harsh and confused mass of clothing often observed in children's pictures. This, of course, is largely a matter of illumination, exposure, and development.

The difficulty of shyness or reserve is more often encountered with single children than in photographing groups. This we can generally overcome by taking the child into our confidence, and explaining the camera as we get it ready, avoiding absolutely any remarks calculated to alarm the little one. I have had the best results when I had the camera set up and focussed on a particular spot, asking the child, perhaps, to show me its eyes wide open for a moment while I secured the proper sharpness, and then allowing it to wander away at will. By noting the surroundings properly, the operator may avoid the necessity for any further use of the ground-glass, putting in his plate, setting the shutter, and, with bulb in hand, awaiting the happy moment of the child's return. A chain, a railing, a curtain, the open window, a door ajar, the end of the piano, a rug on the floor—all these may serve as locating points for the little boy or girl to be pictured and helped us to get them on the plate.

Generally, the chief annoyance the ambitious worker will have results from the well-intended efforts of the friends and relatives of the child to help. A charming disorder of apparel is seen; but the child is promptly taken off and hastily attired in its best bib and tucker, meanwhile being often pulled into stiffness and ill-humor. Then, when shining with the face-rubbing, stiff in its unaccustomed finery, the little one comes to the camera, the friends come, too, and it is "Now, Edith, look pleasant; *do* hold your head up!"—"*Don't* stick your fingers in your mouth," and so on, *ad nauseam*, until the poor child is utterly impossible. Under such conditions I have found a little guile very useful: Let the well-meaning relatives or friends stiffen up the subject to the last notch of woodenness, and then go through the motions of an exposure, all but exposing the plate. Then, explaining that you merely want to try an experiment, drive out the friends, get the child soothed into naturalness, wait until all memory of the ordeal has passed, and take your own chance with the plate! As to clothing, there can be no question that the best is that in which the child will be most comfortable. The simpler it is, the better; it is the child you are picturing not the dress.

It is always better, provided the worker is properly acquainted with the child, to have not more than one other person about. Nothing so detracts from naturalness, or so tends toward the usual studioishness of the gallery portrait, as a number of assistants. Get rid of them, all but one sympathetic helper who can be depended upon to do only what you say, and your chances of success are far better. A child is easily confused, and does not yield so well to the camera's needs when several people claim attention.

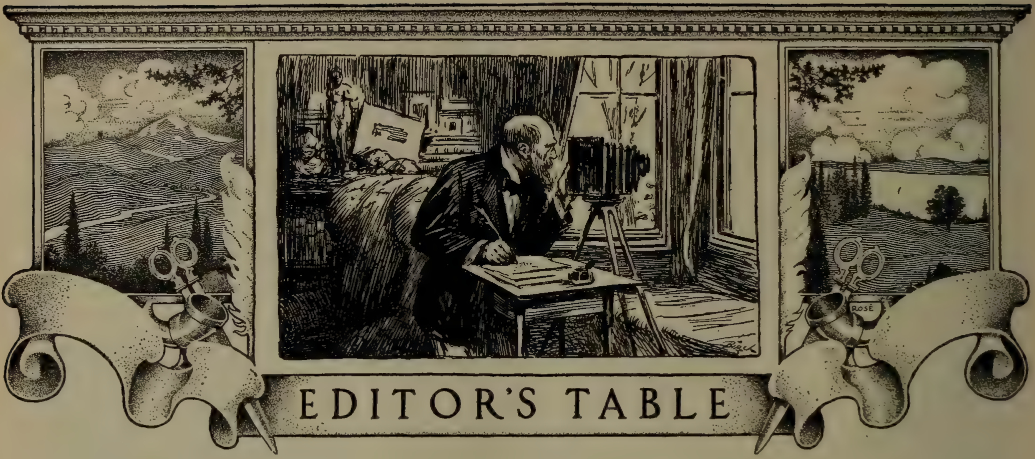
Very young babies are hard to manage, unless in the mother's arms. The spectacle of a plump child piled into a chair in which it is unable to sit alone may be pleasing to the parents, but there is no picture coming. The very little one is often most charming as the mother holds it, and with proper care results that are pleasing may be had. Unconventional

By E. B. CORE, NEW YORK

pictures may be made by preparing for the work in a very bright light, the camera resting on a stool or large book, focused on a selected spot, wherein the child is induced to creep. Many dwelling-houses have large windows, so that when the curtains are fully put aside the light is strong enough to permit of exposures of one-half to one second; and while some plates will be wasted, some priceless negatives may be obtained. When the child is able to stand up to a chair the sympathetic and well-prepared worker has some fine chances, and pictures which show the bare feet of the little child are often most charming. The baby may be induced to play on a dark rug, placed in the proper light, and then it is a matter of patience and good judgment.

In photographing children with their toys two or three little points need close attention. It is better, for instance, to wait until the little ones are really interested and busied with their toys than to get them merely holding a toy and looking at the camera.

Sometimes a toy in the hands of a very young child is an obstacle to success, because the baby will put things to his mouth. Here, of course, the toy should be retained by the photographer or kept out of sight altogether. When and where and how to use toys in handling children are, in fact, questions which can only be carefully answered with a knowledge of the children and the circumstances. Occupation of some interesting sort, or a picture-book, may often be substituted for the toy with positive advantage. Perhaps the most charming of all the children's pictures I have seen is a group of children "playing school," made by Mr. Core (see illustration). The group comprises five or six children of one family, and takes the form of a lateral triangle running lengthwise across a 5 x 7 plate. Four of the children, arranged in the order of their ages, are grouped closely together to form an oblique, irregular line, dividing the picture space from upper left- to lower right-hand corner. The way in which they nestle together to see a folio held in the hands of an elder child is very delightful. At the left hand the dark figure of an elder brother, busied with a design upon the miniature blackboard or wall-slate, adds force to the motif, and at the lower apex of the triangle sits the baby of the family, slightly separated from his fellows, independently occupied with a picture-book in proud imitation of his companions. Pictorially the little figure binds the composition together, and the arrangement of lines and tones gives one a continual feast of pleasure and interest. Numberless compositions along similar lines will suggest themselves, in which the small furniture so commonly used by children nowadays may be made to help in the picture-making.



EDITOR'S TABLE

ON ADVERTISING

WE will take it for granted that advertising, in one form or another, is a necessity in the building up of photographic business.

It simply becomes a question of how to advertise; what to say and what not to say. So much depends on the impression you create in the minds of the people who see your advertisement.

You had better say too little than too much. What is left unsaid cannot come back at you.

If you write your own advertisements be careful not to make statements that you cannot back up, or if you employ someone else to do your advertising, see that they do not commit you to more than you can perform.

Beware of the "literary" advertisement—a beautiful string of adjectives is less convincing than a plain statement.

In your newspaper advertising a few simple statements set in good plain type will, in the long run, carry much more weight than extravagant claims set in fancy type with frills.

Let your circular matter be the best you can get. Good paper, good type, and careful composition. As an artist you appeal to the artistic side of your clients. Carry it out in your advertising as well as your picture-making.

Do not advertise "how cheap," but "how good." The demand for good portraiture can be increased a hundred-fold just as soon as you can make portraits that are portraits.

DARK BACKGROUNDS AND SIMPLICITY

THE dark background has done yeoman service for American photography: it taught the value of simplicity. If we change to light backgrounds we shall find ourselves in a more difficult position. For though success with a dark background is only moderately easy, success with a light one is still less easy. There is little doubt, however, that with light backgrounds the *best* men will achieve greater triumphs than they have with the dark ground, and these triumphs will be most complete in the portrayal of the more delicate gradations of spirituelle feminine beauty. Look through the last volume of the Journal. Half the frontispieces have light backgrounds, and only two or three have absolutely dark ones. The management of a light ground, to score a complete success, is difficult. How harsh and prominent the hair is apt to show against a light background, and how dark flesh so often looks against anything very light. But in capable hands a more subtle and delicate modelling can be obtained against a white ground than against a dark one.

The question hinges on relative tone and on tone value. Tone is not color or even tint. It is the amount of light received by any part of an object and is judged in its relation to the light received by other parts of the same object. A picture may be flooded with light from behind the camera, all visible parts being equally illuminated, and if so all the picture will be in one tone. There may be white lace against dark velvet, and one photographs light and the other dark, giving, it may be, a very beautiful and altogether pleasing picture. But that is due to differences of color, not of tone. With dark backgrounds we do not get better relative tones than we do with light; but it is easier to get acceptable results.

We often hear the question asked, "What is there in it?" when a photograph is shown and eulogized. But the answer is, "What is there left out?" The beauty of a picture often consists in the absence of the disturbing objects. Introducing what should be pleasant and attractive ones is dangerous. The art of omitting is everything.

With the dark background we have developed this art; and the omission has gone further than accessory. A brilliantly lighted figure against black stands out boldly, and at first may please; but soon the effect is tiring. We have, therefore, striven to keep our figures somewhat subdued, and have tried for success in the delicate harmonizing of flesh and dress and background.

There may be times when even a checker pattern may pass as a background—but only in genuine at-home portraiture. If a man is photographed in his study or a lady in her boudoir the real wall paper and everyday objects may improve the photograph for all those who know the sitter amid such surroundings; but to place the sitter with some pronounced studio surrounding which has no connection with his everyday life is invariably a mistake.

It is a mistaken notion that the customer demands some special thing. It is the photographer who takes up glossy or matt or some other style and says it is the latest novelty—and forces it on the customer. People will take good work as quickly as that of indifferent quality. If it is not easy to see a valid reason for using an accessory, let the accessory be omitted. It may be that there is one way of introducing it to advantage; there will be several ways of introducing it to disadvantage; and therefore safety lies in omission. The fashion of dark backgrounds has tended to teach us breadth, and therefore it is a good fashion; it has, too, helped toward simplicity, and therein it has steered us clear of many dangers. If we return to light backgrounds and accessories let us feel our way gently, knowing why we make any move before we do make it, and remembering that we are returning into a more difficult field, where a complete triumph may perhaps be a great triumph, but where the dangers are rendered more dangerous and infinitely more numerous.

PRACTICAL PAPERS ON STUDIO WORK AND METHODS

The Focusing Screen

A KNOWLEDGE of facial anatomy would prevent a retoucher from treating the nose as if its bone ran from base to tip. It would teach him that the lower part of the nose has no bone in it at all, and that the line of light on the upper part should not be carried in an unvarying run right to the high-light on the tip. It would teach him also that a sitter's forehead should not be smoothed out until it looks like the outside of a pudding. Phrenologists say that the part of the brain which controls the perceptive faculties is situated in the front of the head, but the "bumps" would be difficult to locate on a badly retouched photograph.

One does not hear so often nowadays the old photographic slogan, "Expose for the shadows and let the high-lights take care of themselves." The best portrait workers today do not admit the soundness of the old saying. They say that the correct way to expose is not to consider the shadows only, but the general effect. They maintain that it is much more important to expose for the halftones than to aim at getting every speck of detail into the shadows.

In representing a natural object by monochrome, a compromise must be made with Nature's scale to secure proper graduation of light and shade. The highest light in a photograph can be no lighter than white paper, and the deepest shadow can be no darker than the deepest tint of the chemical deposit; and the range of gradation between the two is very small compared with the infinite gradations of Nature. Absolute truth, therefore, cannot be secured; something has to be omitted—and it is just here where art steps in to help the photographer.

Many successful studio operators fail conspicuously when they turn their hands to home portraiture. This is due to the fact that they treat home portraiture as something entirely different from portraiture in an ordinary studio, and do not make an intelligent use of the experience in lighting which they possess. The studio operator controls his lighting almost entirely by adjusting his blinds and head-screens, and not by moving the sitter in relation to a fixed light. When he finds himself in a position, therefore, where he cannot use blinds, and where there is no room to use a head-screen, he is at a loss, and his portraits frequently are no better than those obtained by comparatively inexperienced workers.

Photographic nomenclature must sometimes strike outsiders as being rather queer and not conveying a true idea of the functions of the various individuals engaged in the making and selling of portraits. Why we should call a man who aspires to be, and often is, an artist, an "operator," as if he worked a linotype machine or a telegraph instrument, is a little obscure, but not more so than to call a lady, whose main object in life is to obtain orders, a "receptionist." It is a term that might more properly be applied to a floorwalker. If we use the word receptionist we must never forget that it means saleswoman, and that good manners and a neat appearance are not the only necessary qualifications for the job. Given a good saleswoman, she should be allowed to devote herself to her proper work and not be required to do retouching or similar work. Salesmanship is necessary in photography, and we believe that finding new business in one way or another is the logical work of the "receptionist."—*Photo Digest.*

The Dark Dark-Room

As many photographers of experience know, the objections to working in absolute darkness in the dark-room are more imaginary than real. For the benefit of the uninitiated, who thereby are deterred from taking full advantage of the properties of panchromatic plates, it may be worth while to give one or two hints on manipulation when working without a safe-light. In loading dark-slides, let these be placed open, one above the other, to the left of the working bench, while on the right are placed the plates, removed from the boxes, but still in their wrappings. Knowing the system on which the manufacturer packs his plates, it is an easy matter to take them in pairs from the wrappings entirely by touch of the glass sides only. A loose, instead of an attached, separator certainly is more convenient when working in the dark; the cards should be kept in a little pile, also on the right, and one taken and slipped between each pair of plates, when the triple unit can be quickly placed in the dark-slide. When it comes to development it is a good plan in our experience to remove all the plates from the slides, stacking them in pairs, film to film, inside a clean box with an open front placed so that the plates themselves will be protected from chance splashes of developing solution while waiting their turn. If this plan is followed it is a simple matter to load plates into a tank with as great a degree of precision as though the film surface could be seen. Where considerable numbers of plates are being developed it is a great advantage to have a light-tight box for the reception of the waiting plates, as one can then use a fair quantity of red light after having covered the developing tank or dish. Developing by time is thus facilitated, but if it is inconvenient to have no light whatever in the dark-room good use can be made of a luminous wristlet watch for timing, or of one of the pocket electric torches, which can be used to render visible the face of a small clock ensconced in an open-fronted box fitted directly under the developing bench.—*B. J.*

Some Remarks on the Choice of a Lens

The selection of a lens should depend mainly on the particular work it is required for. An instrument designed for process work is not the most suitable for busts, nor a lens of the Petzval type the best for outdoor groups.

These considerations, however, are not always paramount when a lens is being bought, insignificant factors often being given first importance, with subsequent loss to the buyer. The indirect loss, in quality of work, brought about by the use of an unsuitable lens may be much greater than the user might think, and quite out of all proportion to the cost of a lens.

I knew one camera user who never bought any but second-hand instruments. These he would always consider, whether they were suitable to his work or not, and he was not a dealer in lenses. There was another who would never look at a cheap lens, and a third who judged all lenses by their place of origin; opining that if a lens came from Germany it must of necessity be right; if it did not, then it wasn't much good for any purpose. Some judge a lens by testing, the said testing being limited to the taking of a couple of negatives. Others are content with the image as shown on the ground glass. The price of a lens is considered as a criterion of its properties, as is also the name on the mount. I have known a good (but cheap) portrait lens lie within reach and idle while an expensive anastigmat of short focus and needle-point definition was used for single-figure portraits. And in another case where a studio was offered a most useful universal lens at a fraction of its value, and although the work was suffering for the want of a respectable lens, it was rejected because no one there recognized the maker's name.

Now the majority of us have no inclination to go delving into optical science; but good lenses for individual or general purposes can be found without this, and very often without paying big prices or looking for makers' names, particularly German names. At the same time it must not be forgotten that a little technical consideration is necessary if we would get the lens that will do the particular job or jobs with the best result.

Take the simple case of a photographer who makes busts exclusively and does not enlarge. What kind of lens or lenses will he require? He does not need more than one, and provided it possesses suitable focal length and quality of definition, the make and price are relatively unimportant. If we wish to pay a big price for such a lens it is quite easy to do so. If we want one at a low figure it can generally be found. Suitable types are the soft-focus anastigmat, the Petzval and the R. R. A single component of a good R. R. or of a convertible anastigmat makes an excellent portrait lens. It is of longer focus than the complete lens, but has not the same rapidity at the same actual aperture. Whatever lens is chosen for bust work, a focal length of at the very least half as long again as the length of the plate used, is advisable, and the quality of definition must be such that perfect sharpness can be got at open aperture, but microscopic sharpness all over is not desirable, and lenses which give it are quite unnecessary for bust work.

But the majority of photographers do more than bust portraiture, and their lens requirements are proportionally greater. Single component of R. R.s and anastigmats are sometimes equal to all kinds of portraiture, even including large groups, but for these the complete lens is more suitable on account of its greater speed and better definition. Of the two types the anastigmat should have the advantage of speed, as it is quite possible to get one that will cover most of our requirements at as large an aperture as *f*/3 while the R. R. is usually limited to *f*/8. A biplanat, which is similar to an R. R., can be obtained with an aperture as large as *f*/4. For child portraiture an anastigmat or a biplanat is essential unless we have expeptionally good light available. For flashlight a lens requires to be fast, and to have definition that is at once deep and good. As in bust work, we must also consider focal length. With full-lengths, groups, and outdoor work there is not the same liberty in this respect; for if we choose a comparatively long-focus instrument we will need much room to use it in, and if small premises or outdoor obstacles prevent our getting far enough away from the subject the lens will be useless. If the lens is to be used exclusively in a certain studio, it can be obtained of the longest focus convenient to that studio; but if wanted for outside purposes as well, it should have at least two foci. Lenses of more than two foci are extremely useful for outdoor work as with them it is possible to nicely fill the plate from as many different distances as the lens has different foci. The shortest focal length should not be less than the short side of the plate. This brings us to considerations of angle of view and covering power. If we do not intend to waste the margins of our plates, the lens must have a big enough angle to illuminate a circle at least equal to the diagonal of the plate. If we require to reproduce detail right up to the edges the angle must be wider than this, so as to keep the picture within the best portion of it. A good lens for group work should give equal quality and depth of definition over the complete plate, and for indoor work it should do this without much stopping down. These qualities can be quickly judged by temporarily fitting the lens to a camera larger than the size it is required for, and focussing up a street scene.

Some photographers use their studio lenses for copying and enlarging. Now while it is possible to obtain a lens with the necessary qualifications for all this work, there are advantages in having a separate lens for workshop use. For this an anastigmat capable of needlepoint definition over a large field is irreproachable. For both copying and enlarging a suitable focal length is one a trifle longer than the length of the negative or positive, whichever is the smaller. For instance, if we are in the habit of copying half-plate prints on to whole plates or larger, or enlarging from half plates, a good focal length will be one slightly longer than 6½ inches. If we are copying only miniatures from larger prints a focal length a little longer than the length of the miniature will do. The same applies to enlarging. At the same time, there is a very wide range in the focal lengths with which it is *possible* to copy or enlarge with, and in the case of large negatives from large originals or enlargements from large negatives it may be impossible for want of bench length to use a long focus lens. The only alternative is a good wide-angle lens, and preferably an anastigmat.

When we come to architectural and engineering work we require lens powers that are not essential for the work already mentioned. Flare, internal reflection, and distortion are now things to be reckoned with, and angle of view, circle of illumination and depth of definition are wanted in larger degree. The amount of flare or light scattering in a modern lens is of no moment to the practical man as a rule. It is so little as to be negligible for all ordinary work, but the commercial worker comes across many extraordinary jobs, and a lens that is suspected of flare should not be relied on for difficult undertakings. The same might be said about internal reflection. A lens with a number of internal surfaces may absorb sufficient light to make it a trifle slower than other lenses of the same aperture. This may not be noticeable on everyday jobs, but when photographing in dark buildings where minimum exposures may run into hours, every ray of light is valuable, particularly the weak ones recording shadow detail, and it is just these that are most easily absorbed. It seems hardly necessary to mention distortion, as obviously a lens that is not rectilinear is useless for general commercial work; but distortion can happen with useful lenses. I remember a lens of a once famous German make, which was in use as a wide-angle instrument. It would certainly illuminate and cover sharply an extraordinarily wide angle, and was used on occasions to the limit of its ability. But the results were not rectilinear, and the lens was eventually relegated to simpler work, and used only at a more moderate angle. A lens for all-round commercial work should have a wide angle of view and an evenly illuminated field of deep definition. Anyone that has focussed up a subject calling for rising front and side and back swing will appreciate this. Without a wide angle and an evenly illuminated sharp field the rising front is useless. Without deep definition, side and back swing are of no value. No one focal length can be recommended, and the experienced commercial worker who is ready for any contingency will have at least three complete lenses of different foci. For half-plate work, 6, 9 and 12 inches are good focal lengths. If convertible lenses are obtained in these focal lengths, the single components will be roughly 12, 18 and 24 inches, and they will come in useful very often, although they must not be expected to have all the qualifications of the complete instruments.

A word about the actual getting of a lens. The simplest way is to write the manufacturer stating exactly what one's requirements are. The next best is to hunt up the right instrument in a good catalogue. But good lenses are often come by in local shops and other studios, but one cannot take such lenses at their face value. Provided the polish on a lens is not rubbed (a scratch or two may not matter, it is the surface in general that must be in condition), and there are no signs of previous mishandling, it is worth while trying any lens that is offered at a reasonable figure. That is, of course, if one has any use for the particular type of lens. But a lens so obtained should be thoroughly tested before purchasing, and if this is objected to the purchase should not be considered further. A maker's name is little to go by unless one knows that the lens bearing it is the same in every detail as when it left the maker. Not very long ago some faulty lenses were sold in mounts that bore a good name, the unscrupulous vendor making a good profit. And a nameless lens is not necessarily a bad one. The very finest universal lens I know, one that is capable of anything from an artistic head to a half-mile of machinery, bears nothing on its mount but the f. numbers.

A lens that is suited to the work required of it is a sound investment at any price, and will prove a good friend for as long as it is cared for.—Thermit, in *B. J.*

Photographing Hands

It might be said that the photographer who can photograph hands successfully, and by that we mean one who can photograph them in such a way that they add to the picture, rather than detract from it, has made an unusual success of portraiture.

Aside from facial expression, no other one thing contributes so much towards the success or failure of a picture to portray the character of the sitter as does the rendering of the hands.

Head and shoulder portraits are often full of character, but we like such pictures because we know the person of whom the picture has been made. Such pictures give us a very poor idea of one whom we have never seen. For that reason the press prefers those pictures which the enterprising news photographer is able to catch of the man on the street, about his home or in his office. Such pictures give a better idea of the man because they show him in comparison with other men and they indicate his size and build and characteristics.

We learn a great deal about hands from paintings, but even more from pictures of prominent people in the illustrated supplements and the magazines. And this will be a fine year for such a study. The papers even now are full of politics, so are the magazines, and from the pictures of those in the public eye an excellent study can be made of hands and their effect on the composition of the picture and the ways in which they depict character.

The photographer who is not clever at posing hands or rather, to put it in a better way, clever in making the sitter unconscious of his hands, does what seems to him the logical thing and tries to hide them.

This is about all that can be done in cramped quarters where a short-focus lens must be used, with the result that the hands, when shown, are usually distorted. But if you have plenty of room and can use a long-focus lens, use it and show the hands.

The position of the sitter doesn't cause distortion; it's the position of the camera, and this is overcome when a long-focus lens is used and the camera is at a sufficient distance to give proper perspective. It isn't necessary, then, to place the hands in any special position or as near as possible to the body. If, however, the sitter is conscious of his hands and is at a loss to know what to do with them, it might be permissible to use a bit of deception and tell him it doesn't matter since you are not including them in the picture. Make him forget them if possible.

Once the photographer realizes what an important part the hands play in the picture—how they show strength, or will-power, or courage, or how they point to artistic traits of character—then the important thing is to give them just the right lighting. If they are shown as two spots of white they will take the attention from the face—if too dark they will not be seen at all. The face should be the center of attraction and the hands of next importance, and they can be used to give proper balance to the picture, aiding materially in composition.

But whatever else you may do in picturing hands, place the camera far enough away from the sitter to prevent distortion. It is far better to hide the hands completely than to have them seem so large that they give the sitter a cause for complaint and make him feel that all photography must be bad because he has had a bad example.—*Photo Digest.*

White Backgrounds

Every now and again we receive applications for a formula for a mixture which can be applied to a background so as to secure the practically opaque deposit on the negative which is the desideratum for sketch portraits. It may, therefore, be said that beyond adding a little blue to the ordinary white distimper nothing can be done in this direction which is of any material advantage. The intensity of deposit in the negative must be secured almost entirely by correct illumination. Very often the background is so lighted that if it were made of freshly fallen snow it would still photograph as gray in the negative. There seems often to be a failure to realize that the soft lighting which the sitter requires to receive for the making of a sketch portrait must not extend also to the background. To get one type of lighting in one place and another in another it is necessary to place the background further away, and by adjustment of blinds (in a daylight studio) or of lamps (in one where artificial light is employed) to secure much more intense lighting on the ground itself. Often enough in a daylight studio the photographer is handicapped by the fact that his glazing does not extend back to the level where the background is usually placed. The conditions then are exactly the opposite of those which are favorable to the lighting of sitter and ground for sketch work. The remedy, obviously, is to bring the background several feet forward, so as to receive ample illumination and to supplement the subduing effect of side blinds upon the sitter by means of head-screens or the like.—*B. J.*

Camera Movements

Occasionally, even in this twentieth century, amusement is caused among photographers by the naive surprise of some people at the total absence of "works" inside even the most expensive camera. For all that it may truly be said that many experienced photographers do not clearly understand the object and use of the various "movements" which usually are all outside the camera. Many produce good results by a sort of instinct acquired rather as a result of long practice than by exact knowledge of how and why a particular adjustment will achieve a desired object. Knowledge of these matters must obviously save a beginner in photography much trouble as well as many plates, and later on will enable him to tackle difficult problems by reasoning out in a logical manner the best and proper procedure to follow, instead of the unfortunately rather prevalent "hit or miss" methods.

There are several distinct moving parts which may be employed separately or in combination to achieve specific objects, and they are quite easy to understand if examined and experimented with one at a time in a systematic and leisurely manner without using any plates at all. In fact, I advise anyone buying a camera to try all its movements carefully in this way before exposing a single plate. I do it myself with every camera I have occasion to use, although (or perhaps it is *because*) I've been over twenty years "at the game."

Before even trying the "movements" there are a few preliminary facts to be digested, and I put forward also a few suggestions that will be found to make easy the study of the camera's "work." The lens and the ground-glass are the principal parts of the camera. The lens has all sorts of peculiarities, most of which are best left alone by the beginner for a time, but its purpose is to throw such rays of light as reach it from each point in the "subject" to a corresponding point on the ground-glass. The purpose of the ground-glass is to allow the photographer to see whether the lens is doing that or not. The camera bellows and body are to keep all other light off the ground-glass except that which comes through the lens. The "movements" of the camera serve the purposes of adjusting the positions of the lens and of the ground-glass toward one another and holding them in such positions, as well as enabling the ground-glass to be replaced very exactly by a sensitive plate held in a dark slide. The various adjustments are necessary, because to have the lens fixed "pointing straight" at the center of the plate, as in a magazine hand camera, does not suit every subject. A cap or a shutter is for the purpose of admitting light through the lens to the plate for a definite time.

All these things may seem so obvious when put into words that the reader will perhaps wonder why I waste space on them. Yet it is essential that the fact be grasped clearly that it is the lens that does all the "work." The "movements" merely permit one to take advantage of, or control, its various properties or peculiarities.

Before examining how they do this, the suggestions I mentioned as desirable are that the ground-glass should be smeared over with a trace of vaseline, which is then rubbed off again as much as possible. This allows the "image" to be seen more brightly. Next, that a small (but not too small) spirit-level be obtained, as well as a set-square or any piece of flat, stiff material cut accurately to a right angle. The remaining need is for a focussing cloth. This is to wrap round the back of the camera and the observer's head, so that light is excluded and the image on the ground-glass clearly observed. Its essential points are that it must be opaque, not too heavy and ample in size. These qualities are best filled by a double thickness of black "sateen" a yard square. Two yards of this material, folded once and the edges hemmed, make an ideal focussing cloth. With these points and needs made clear we are in a position to examine and study any camera with ease in all its details.

When the reader sees by the list below what a great variety of adjustments there are that may control the respective positions of the lens and ground-glass, he will realize why I emphasized by a whole preliminary paragraph what they are really for, before plunging him into detailed explanations of each movement. Every stand camera has some of these movements; few, if any have them all.

The four main portions of the camera are: The *front*, carrying the lens; the *back*, with ground-glass and grooves for replacing this by a plate held in a dark slide; the *bellows*, which connect the first two and keep all outside light from penetrating, while allowing the parts to move freely; the *baseboard*, which acts as a support for the other parts and may itself be fastened upon a tripod or other stand. When set up in a normal position both the front and the back should be at right angles—both vertically and horizontally—with the baseboard, and therefore quite parallel with one another. This is easily tested with the set-square, and if the camera as bought is found not true in this respect marks should be made so that the parts can be set up correctly and fixed so at any time subsequently. Taking each of the parts separately the list of useful movements is as follows:

Front

Rising (and Falling) Front. Sliding up and down.

Cross Front. Sliding sideways.

Swing Front. Pointing lens up and down.

Side Swing. Pointing lens to one side or the other. (This movement is rarely provided on a camera, but can generally be improvised when required.)

Back

Reversing Back. Allows ground-glass to be placed "upright" or "across." The former is mostly used for portraits, and the latter for landscapes, and is often termed "landscape-way" of the plate.

Swing Back. Swinging toward or away from the front, pivoted either centrally or at the bottom.

Side Swing. Same remarks as side swing on front, but is usually found on studio cameras and on many fixed cameras.

Baseboards

Adjustable Extension. Sliding movement to allow of varying the distance between the front and the back. This may be a single slide either of the front or the back.

Preferably the camera should have a "double extension," *i. e.*, an inner frame sliding forward and carrying the front with it on turning the milled knob of a "rack-and-pinion." This allows the lens to be carried further from the plate than a single-extension camera, which latter is very limited in scope. A "triple extension" allowing of still longer distance between front and back is still more useful, provided that the camera is not so flimsy as to wobble or sag when extended.

Turn-table. This is a revolving metal ring to which the legs of a tripod are attachable. If this is not present there should be a screwed "bush" for attaching to an ordinary tripod top by means of a screw.

Bellows

These have no special adjustments, being flexible, but in long-extension cameras it is usual for there to be rings attached to folds near the middle for supporting the weight of the bellows at short extensions, and so prevent sagging into the path of the light from lens to plate.

The lens itself has one moving part that should be explained before going into the adjustments of the camera body because it does more to affect the image than almost any other item, and the other movements are always considered in conjunction with this one. That is to say, the other adjustments will either help or hinder the work of this essential one. The part referred to is the "diaphragm" of the lens, a device for making the aperture of the tube larger or smaller. It may be a wheel with holes of various sizes or a set of plates also with different sized holes to slip into a slot, but most lenses nowadays have a built-in "iris diaphragm" which opens and closes on turning a ring or pointer.

Let the camera be set up with front and back "normal," *i. e.*, at right angles to the base, and the lens as central as possible with the plate, opening the lens diaphragm or "stop" as far as it will go, and point it toward some brightly lit objects. On moving the lens or the back to and fro while the observer's head is under the focussing cloth an image will be seen on the ground-glass more or less distinctly. Here let me warn the beginner to keep his head well back and to look *at*, *not through*, the ground-glass. The sliding to and fro is called focussing, because one brings to a focus, or sharp point, the image on the ground-glass of part of the subject seen. All the subject will not become sharp at one time, because parts which are at different distances require different lengths of extension between lens and plate. The further away the object the shorter the extension required. Beyond a certain distance all things seem sharp without altering the focus, but with comparatively near objects a great deal of movement is required between the points at which the camera gives one object sharp or another. Although this is elementary, I should like to ask the reader to carry out a sort of practical exercise at each stage, even if only to satisfy himself that what I say is true. Reading alone will not fix things in the mind, and I want to get the elementary points well home so as to make it easier for the student to get hold of things that may seem a bit more complicated and not so obvious later on.

When the ''focussing practice," as perhaps I may be allowed to call it, has been tried on several different subjects, distant, near, and near and distant combined; when the sort of images produced by these with the lens at "open aperture" have been observed and carefully compared, as well as the various lengths of extension, preferably by means of actual measuring, let one of the "near-and-distant" subjects be focussed on a point about a third of the distance back from the nearest principal object to the furthest one. Then, while looking at the image, close down the lens aperture, and it will be seen at once how other objects besides the one most sharply focussed become sharp also. At the same time the image becomes much dimmer all over, because less light is allowed through. Therefore in exposing a plate more exposure is needed to make up for the weaker light.

This simple example is put forward not only for the knowledge of the direct effects of "stopping down," as reducing the size of hole is termed, but to show that photography is all through a matter of compromises. As a rule you cannot have a large aperture for short exposures and sharpness of varying distances at the same time. The latter quality is called "depth of focus," and is increased by using a smaller aperture.

The meaning of the numbers of the apertures will be explained later, as they are for use in extimating exposures. Any want of sharpness in the image, due either to the lens itself or to the use of the various movements of the camera being brought into play, can be partly or wholly overcome by stopping down. Sometimes these movements are used to prevent the need for using small stops, where short exposures are essential. These will be taken one by one and explained fully in subsequent articles.—D. Charles, in *B. J.*

Working Against Time

Most professionals are faced now and again with the problem of getting out work at a few hours' notice. Taking photographs for the press nearly always means a rush, especially for the provincial photographer when he makes his exposures during the afternoon and has to get his prints off by the evening mail. Then again, photographs are sometimes wanted in a hurry to produce as evidence in the law courts, especially in cases dealing with ancient lights.

It is usual at such times to dry the negative with methylated spirits, then print in bromide and, when the prints have had a short washing, to dry them in the same way. But it is easily much quicker to make bromide prints from the wet negative, after it has had a rapid washing, say, in nine or ten changes of water. When a little care is used there is practically no risk of spoiling the negative by this method.

After the negative has had sufficient washing, put it in a dish of clean water. Next lay a sheet of bromide paper in the same dish and let it soak until it is quite limp; press the surface of the paper against the film of the negative, under the water in order to avoid air-bells, in the same way as you would transfer a carbon print from an opal temporary support to the final base. Now lift the negative with the paper in contact from the water, and lay them, paper side uppermost, on a large sheet of glass or a perfectly flat board; lay over them a sheet of blotting paper folded in two, and run over very lightly three or four times with a roller squeegee. The next step is to lift the two very carefully and lay them down again on the same glass or board, this time with the glass side of the negative uppermost. Wipe all water or markings from the glass of the negative with a clean duster.

Everything is now ready for making the exposure. For this there is no need to put the negative and paper into a printing frame; the paper is in perfect contact with the negative and moving the two into a frame would only mean a risk of shifting the paper or of damaging the soft film of the negative. The best way to make the exposure is to hold a lighted taper or wax vesta about five inches above the negative. The exposure, with a negative of average density, will only be about six or eight seconds, if a bromide paper is used. The taper or vesta, of course, should be moved about in order to expose the paper evenly.

After the exposure, again put the negative and paper into clean water, and strip off the paper. The print can now be developed in the usual way.

After fixing, the prints should have about ten changes of water. They can then be well blotted and put into a dish of methylated spirits, and allowed to soak for from five to ten minutes, or until the image is visible through the backs of the prints. When taken out of the spirits they should be well pressed between sheets of dry fluffless blotting paper and then dried over a gas ring or in front of a fire.

It is not wise to attempt more than six prints from the same negative by this method, because, by the time you have printed that number, the film of the negative will have become so tender that it will not be safe to risk any more copies. If more are wanted the negative should be hardened in an alum bath.

If the negative is valuable and likely to be used again, it should be put back in the fixing-bath and afterward thoroughly washed in the usual way.—*Professional Photographer.*

Keeping Your Promises

What about the promises you make customers?

This isn't mere curiosity; it's just a question you might ask yourself. If you can answer that you don't make promises unless you are sure you can fulfill them—why, it hasn't the least bit of impertinence in it.

The ancient saying that "promises, like pie crusts, were made to be broken," has been retired on an old-age pension. The man or the firm that attempts to do business with hot air doesn't get anywhere. And unfilled promises are the worst kind of superheated atmosphere.

We are all guilty, at times, of longing to push truth back into her well, and promise what we must know—back in our heads—that we can not quite live up to.

But as long as you fight this unworthy desire and have the mental grit and the psychological stamina to say you will deliver the job not a day sooner than you know you can, you're well on your way to earning a reputation that is worth money.

If you get in the habit of delivering the goods on time, you won't have to deliver excuses.

Every promise kept, makes the next one easier to keep.

Neatness in the Studio

Taking it all round, we are inclined to think that the photographic studio is the most difficult place imaginable to keep clean and tidy. Do what you will, the general effect after taking a few sitters is more reminiscent of a rag shop than the most important room in a presumably artistic establishment. Certainly, public opinion rather expects untidiness in such a place; but a lady client in an expensive dress would much prefer cleanliness, while orderliness is essential if operating is to be conducted with any degree of comfort and despatch. When one is obliged to store canvas palaces and weird woodland in one and the same place, as well as broken balustrades, stone steps, garden seats, oak settees, several varieties of chairs, not to speak of the amount of space occupied by small headgrounds and reflectors, the general effect is bound to be somewhat incongruous.

Try as one will, it is impossible to carry out the theoretical idea that a studio should resemble an ordinary room. To secure the most pleasing results, both in the sitter's expression and subsequent order, every effort should be made to make the studio as inviting as possible. Many people are affected to a remarkable extent by their surroundings, and most are more susceptible than usual when visiting the photographer's, for even now our craft is still tinged with the mystery of the unknown.

It is essential that the general scheme of decoration be extremely reserved and subdued, and as harmonious as possible. A bold scheme, however pleasing it would be in a private room with a carefully selected suite of furniture, would appear merely as a discord when so many varying articles are collected within it. The usually advised gray walls we do not care for: they are too cold, and likely to prove quite out of keeping with any upholstery. It may, however, be necessary to use this color if the studio is narrow and reflected light essential. When a free hand can be taken, a green or a brown scheme appears to us to be much more cheerful and has the advantage that drapery, curtains, etc., can easily be obtained to match. To make a studio at all presentable every opportunity of securing repetition should be taken in order to give the general appearance a feeling of unity. Variety there will be and to spare without seeking for it. If the walls are plaster, a good matte paper, devoid of pattern, should be used with perhaps a quiet stencil for frieze. Many studios have matchboard partitions; than which nothing looks worse. They are, however, remarkably easy to treat, since anyone of average intelligence can apply a fabric wall-covering, skirting board, and picture rail to such an amenable base. The art canvas in various colors supplied at about seventy-five cents per yard of fifty-two inch wide may be stretched and tacked in position or the fabric hangings sold under various fancy names and prepared for pasting on the wall may be used. They are only thirty-six inch wide and more expensive per yard, but we find them very much more durable and really easier to hang. If the ordinary art canvas is used, it is essential that the matchboard be first papered over, preferably on both sides of the partition, with some cheap paper; ordinary brown will do. If this is not done, dust will work through the joint of the boards and make dark streaks on the canvas. The doors and other woodwork should be painted a shade darker than the wall covering, but never have the doors picked out in two shades.

Floor covering is another important item. Without any hesitation we recommend a good linoleum. It is easy to keep clean, castors on the various accessories run easily on it, dropped chemicals will not affect it, if good it is extremely durable, and, lastly, thoroughly artistic designs can now be had. Linoleum is very warm and elastic to the tread, but we find the colors apt to become dirty and degraded in parts. We do not care for perfectly plain, self-colored floor-cloths, since they are monotonous and show the dirt badly. Any bold pattern is to be avoided, especially geometrical and floral designs. A small indefinite pattern of a slightly darker or lighter shade than the ground are quite inoffensive; but, as a general rule, at the risk of being called over the coals by the purists for advising an imitation, we cannot conceive a more admirable material than inlaid linoleum in simple parquet designs. Of course, a real parquet floor is the height of one's ambitions, but very few photographers are in a position to, or would be justified in, having one laid. When selecting a design, it must not be forgotten that parquet patterns are innumerable, and that the majority are unsuitable for photographic purposes. One or two small rugs will be required to break up the floor space, and if of an almost plain design will be useful for interiors. Here, again, we prefer to match the general color scheme rather than employ Oriental rugs, rich as they appear to the eye, but totally unsuitable for inclusion in a picture.

The skylight shades are usually black, and this from practical motives is advisable. Any other curtains, however, should be in a plain, unpatterned material of the prevailing color. In place of the usual black camera cloth, we have one made out of the same fabric as our curtains.

The trite old saying, "A place for everything and everything in its place," should occupy a prominent position in that imaginary spot known as one's mind's eye. It will often be found that orderliness and neatness take the place of muddle merely by changing about the usual position of accessories: this stool will go under that chair, this chair under that table, and so on. It is foolish to keep any unused lumber; its room is of greater value.

Backgrounds are perhaps the most insistent sign of photography in the studio, and too often their general appearance brings them into undesirable prominence. One of the first moves in the improvement of the studio should be some neat and compact system of storing the grounds. The rolled-up ground does not look particularly pretty, and we find it adds to the appearance if a wide piece of moulding, preferably on the same level as the frieze moulding, is fixed in front of them to hide them when rolled up. Grounds on stretchers are ungainly and very frequently an eyesore, owing to ragged edges, crooked rows of tacks, and bare white strecther or stretcher edges showing. The two latter defects are overcome by painting the frame before stretching the background, and the two former by tacking three-quarter inch black tape over the lines of tacks and cutting off any ragged edges of background not covered with a sharp knife.

After executing these permanent aids to neatness, the more frequently needed attentions of the scrub lady should not be forgotten. The floor should be washed at the very least once a week, while the upholstery should be brushed, and the camera, furniture, and ornaments dusted every day. Above all, do not leave lying about stray negatives, printing frames, prints, drying racks, mounts, blotting paper, or any of the manipulative branch of the work. Of course some studios are obliged to use the studio as a general workroom, but some scheme should be devised to keep such signs of one's business as unobtrusive as possible.—*B. J.*

VIEWS AND REVIEWS

Report of the National Convention

It is generally conceded that the National Convention at Milwaukee, "The Better Business Convention," was one of the best ever held. The attendance of photographers, manufacturers and dealers was about seventeen hundred, and exceeded expectations. The weather was all that could be desired and added much to the comfort of everyone. The rather extensive program was carried out. Dues were raised to $10.00 a year for active and $3.00 for associate members. ($2.00 for manufacturers and dealers). The code of ethics was included in the constitution. The new officers are:

Howard Beach, Buffalo, N. Y., President.

J. L. Hostetler, Des Moines, Iowa, 1st Vice-President.

A H. Diehl, Sewickley, Pa., 2d Vice-President.

Clara Hagins, Chicago, Ill., 3d Vice-President.

Clarence Stearns, Rochester, Minn.

Eleven Salon honors were awarded by the Judges, Pirie MacDonald, S. L. Stern and Eugene Hutchinson, to the following:

Frank Scott Clark, Detroit, Mich.; The Gerhard Sisters, St. Louis, Mo.; T. Kajiwara, St. Louis, Mo.; Strauss-Peyton Studios, Kansas City, Mo.; Richard T. Dooner, Philadelphia; the late Pasquale Culotta, of Baltimore, Md.; Will H. Towles, Washington, D. C.; Elias Goldensky, Philadelphia, Pa.; Lejaren a' Hiller, New York City; Howard D. Beach, Buffalo, N. Y., and Francis J. Sipprell, Buffalo, N. Y.

The Interstate Trophy was won by the Missouri Valley Association with Missouri Valley, Ohio, Mid-Indiana, North Central and Middle Atlantic States Associations competing.

The next place of meeting was left for the incoming board to decide. President Lewis and his associated officers deserve great credit for the fine and successful management of this big convention.

The Commercial Photographer

L. G. Rose. Profusely illustrated. 150 pages. Cloth, $4.00; postage, 15 cents. Frank V. Chambers, publisher, 636 Franklin Square, Philadelphia, Pa.

The papers contained in this volume orginally appeared in the *Bulletin of Photography*. The great demand for extra copies of this journal prompted the publisher to issue in book form for the convenience of the reader, and to further extend the circulation of a publication to the commercial photographer. For hitherto but little in book shape has been available for reference in this most important branch of the professional photographer.

The author is thoroughly competent to give valued information from extended experience in every department and from personal application in many of the various branches included in this particular photographic work. And, of a consequence, the subject is treated in a way which shows that the writer appreciates the importance of considering all the detail essential to success which might be overlooked by one not so thoroughly conversant with the topic.

The subject is discussed under different heads, in a clear, concise way, which takes particular account of the necessary appliances, apparatus, lenses, character of plates, exposure and whatever else is necessary for the production of the best work. Then the important feature of illumination is considered and the best manner of arranging the subject so as to present the features in a way interpretative of its character, and in a manner the most attractive, an important consideration sometimes not sufficiently regarded by the photographer.

A perusal of the contents shows at a glance the exhaustive way the subject is handled, and the direct manner of conveying the information shows forcibly that the purpose of the author has been to enter particularly into such detail in manipulation which the practical worker knows to be of essential worth to him in furnishing such means which his limited experience demands, when an operation is undertaken with which he is not familiar.

We do not know of any other book on this subject which covers so much ground or which conveys so much definite information, and the demand for it will be very extensive, and we predict that this first edition will be speedily exhausted and therefore caution those interested to secure copies of *The Commercial Photographer* in time and not be put to straits waiting for another issue.

Bertram Cox Exhibition

An exhibition of forty-three examples of the work of Bertram Cox, F.R.P.S., of London, England, opened at the Camera Club, New York, on September 1, and will continue until October 15. The prints exemplify the bromoil process, in which Mr. Cox is a master. They are 15 x 12 in size. They are attracting an unusual attendance and interest, for this is the first one-man show ever given in the United States, as far as we know, of any of the foremost British or other European workers.

Mr. Cox as a technician is among the best, and is particularly happy in delivery of expression, subtleties and the manner in which he blends and melts his tones. An evenness of quality is a distinguishing feature of his work, this being apparent both in his earlier and latest examples.

His exhibit comprises quite a number of his published pictures, and those exhibited at the Royal Photographic Society and the London Salon, as well as society exhibitions throughout the United Kingdom, which is interesting, particularly to many here who, while abroad, have seen them on display at such times and when given to the public in one-man shows.

So excellent are these pictures that it is difficult to distingush the best—they are all of outstanding merit. Still, were a designation required, we should mention: "At Weybourne, Norfolk," "An Evening in June," "Grawsworth Common," "Lincoln from the South," "Bradford, Lincoln," "A Day's Work Done," "Tuesday Market Place, King's Lynn," "Broadgate, Lincoln," "Runton Gap," "Brothers of the Brush," "An Inn at Knutsford," "At Ely," "To the Sea," "The Cheshire Plain," "The Little 'Ouse," "The Bishop's Eye, Winter," and "Sudden Storms are Short."

New Rexo Dupli-kit

The Rexo Dupli-kit is a thin metal mask which fits in the back of the camera over the bellows frame and masks off the opening so that a picture one-half the regular size will be obtained when Rexo Speed Film is used.

With this mask twelve pictures half the regular size are made on a six-exposure roll, twenty on a ten-exposure roll, and twenty-four on a twelve-exposure roll.

No special attachment or extra ruby windows are required. The black paper used on the Rexo Speed Film is printed with an "X" between each exposure. This shows where to stop to obtain half-sized pictures. Full instructions for use with each Mask.

The Rexo Dupli-kit System can be used in all popular hand cameras with a Rexo Dupli-kit Mask and Rexo Speed Film of the corresponding size.

Lens Cleaning Tissue — A New Wollensak Product Designed for Proper Cleaning of Photographic Lenses

The proper cleaning of photographic lenses is a thing that sometimes puzzles even the best of photographers.

A very satisfactory method of cleaning lenses is through the use of Japanese tissue which is made from the bark of the Japanese Mitsumata. This tissue is free from any abrasive and so proves very satisfactory for cleaning purposes.

These booklets are put up in convenient form 4 x 6½ in size with sixteen pages of tissue to the book. They also include suggestions for the proper cleaning of lenses which will be found of definite assistance to the photographer. They can be obtained at all dealers in photographic supplies.

Photo-Engraving Primer

Stephen H. Horgan, American Photographic Publishing Co., Boston, Mass. Price, $1.50 net.

This book is a primer. It contains concise instructions for apprentice engravers or for those seeking simple yet practical knowledge of line and half-tone engraving. Its author, Stephen H. Horgan, has long been known as an authority on the subject as editor of "Process Engraving" in *The Inland Printer* and author of Horgan's *Half-tone and Photo-mechanical Printing Processes.* Every phase of photo-engraving is made clear, and there is a complete glossary of terms and index, which makes this primer quite complete. We are glad to recommend it to all interested in this subject.

How to Avoid Blisters

Fresh solutions are essential. Do not use developers containing strong alkali and avoid forced development.

Be sure that the acid short stop is reasonably fresh.

The fixing-bath should be carefully made according to formula and it is of the utmost importance that this bath be not overworked. Three gross of 4 x 6 paper or equivalent are a sufficient number of prints to fix in one gallon of freshly made bath.

The toning should be accomplished as soon as prints are fixed. If a delay is necessary, it is advisable to wash long enough to remove excess hypo and dry the prints in black and white rather than to allow them to soak for an indefinite period, thereby causing the paper stock to become softened.

The temperature of the toning bath should not exceed 120° F.

When toning is completed, place prints on a glass to drain and permit gradual cooling, then sponge to remove sediment from toning bath.

Wash for thirty to forty-five minutes. Dry as usual.

Suggestions

If we are to make a success of our studios today we must realize that in this, the twentieth century, great strides have been made artistically. The early Victorian and art nouveau are things of the past, and what would have been accepted a few years ago will not be looked at now. Not only is it necessary to keep our pictures up-to-date, but also our studios and displays. Remember, a blank wall is much better than out-of-date specimens. It is a good plan to go through your specimens carefully at least once a year, and do away with any from which you have not received any orders, or which look old-fashioned, either because of the costumes worn or the accessories used; but whatever you do, do not shift them to a darker corner of the room, or into the dressing-rooms, or on the staircase. Be brave and scrap them, for by showing a lot of out-of-date pictures, you are seriously depreciating your up-to-date work, from which you are actually taking your orders.

Price-List Adopted by Chicago Commercial Photographers

EXTERIOR PHOTOGRAPHS

8 x 10—Within 3-mile limit.	$5.00
8 x 10—2d exposure, same trip	3.50
11 x 14—Within 3-mile limit.	7.00
11 x 14—2d exposure, same trip.	5.00
Time waiting, per hour	1.50

INTERIOR PHOTOGRAPHS

8 x 10—Time exposure and artificial	$6.00
8 x 10—2d exposure, same trip.	4.00
11 x 14—Time exposure	8.00
11 x 14—2d exposure, same trip.	6.00

When flash or electric lamps are used a charge of $1.00 for each extra light will be made.

When flash bags are used a charge of $1.50 for each bag will be made.

For work beyond the 3-mile limit, add $1.00 to the first exposure price for each additional three miles traveled from the studio.

PHOTOGRAPHS MADE IN STUDIO

5 x 7	$2.00
8 x 10	3.00
10 x 12	3.50
11 x 14	4.00

Preparation and set up in excess of ½ hour for each exposure will be charged at $1.50 per hour.

COPIES

5 x 7	$1.50
8 x 10	2.00
10 x 12	2.50
11 x 14	3.00
14 x 17	5.00
16 x 20	6.50
18 x 22	8.00
20 x 24	10.00
Yellow color correction	25% extra
Red color correction	50% extra

COMMERCIAL SUBJECTS AND FLAT COPIES MADE OUTSIDE STUDIO

For the first exposures apply the first exposure rate for interiors or exteriors, as per conditions prevailing, making sure to charge for any additional mileage.

For the additional exposures apply studio scale for commercial subjects or flat copies, as the case may be; subject to such extra charge for preparing, posing and color correction as covered in studio prices.

Real estate exteriors in lots of 10 or more within city limits, to be made at our convenience, may be charged at flat rate as per additional exposures.

Graflex or press work within three miles of the studio, $10.00 per assignment, including 2 or 3 exposures.

$3.00 for each additional exposure made at same time and place.

FOR OUT OF TOWN WORK

Transportation expenses en route and hotel expenses to be paid by customer.

A charge of $15.00 per day to be made in addition to regular city prices for all photographs made.

MISCELLANEOUS

For lost trips and time waiting beyond appointed time, as well as time waiting between a series of exposures to be made, a charge of $1.50 per hour will be made.

For blocking, etching and lettering, charge $1.50 per hour.

A charge of $1.50 per hour, to cover overtime, will be made on all assignments outside of regular business hours.

For surrender of negative a charge of one-half of rate for photo made in studio, will be made.

BROMIDE ENLARGEMENTS.

Black and white enlargements 6-10c. per sq. inch; minimum, 75c.

Sepia enlargements 25 per cent. extra.

Mounting extra—Same price as for contact prints.

Lot of 6 prints from one negative	10%
Lot of 12 prints from one negative	15%
Lot of 25 prints from one negative	20%
Lot of 50 prints from one negative	25%
Lot of 100 prints from one negative	30%

UNMOUNTED PRINTS—SINGLE WEIGHT

	Number of Prints from One Negative								Add for mount'g	
Size	1	6	12	25	50	100	500	1000	Cloth	Cd'bd.
4 x 5	$0.10	$0.09	$0.08	$0.07½	$0.07	$0.06	$0.05½	$0.05	$0.04	$0.08
5 x 7	.25	.20	.15	.12½	.10	.08	.07½	.07	.05	.10
8 x 10	.50	.40	.30	.25	.22½	.20	.17½	.15	.07	.15
10 x 12	.60	.50	.40	.30	.25	.22½	.20	.17½	.08	.20
11 x 14	.85	.70	.60	.50	.40	.35	.30	.25	.12	.25
14 x 17	1.25	1.00	.85	.75	.65	.60	.55	.50	.18	.35
16 x 20	1.75	1.50	1.25	1.00	.85	.75	.70	.65	.25	.50
18 x 22	2.25	2.00	1.75	1.50	1.35	1.10	1.00	.90	.35	.75
20 x 24	3.00	2.50	2.25	2.00	1.75	1.50	1.35	1.25	.50	1.00
Postals						.07	.05	.04		

For printing on double weight paper add 25 per cent. to list for unmounted prints.

For Sepias on single weight paper add 25 per cent. to list for unmounted prints.

For Sepias on double weight paper add 50 per cent. to list for unmounted prints.

The WORKROOM

CONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

Photographs on Opal and Ivory
Causes of Fading in Photographs
Carbon Prints on Daguerreotype Plates and Aluminum
The Sulphide Toning of Bromide Prints
Sulphide Toning
Enlarging
Washing Plates and Prints
An Iron Developer for Plates, Films and Paper
The Bromo-Iodide of Copper Intensifier
Matt and Glazed Portraits by the Carbon Process
Stripping Films From Glass Negatives
Waterproofing Dishes of Wood
How to Mix a Developer
Determining the Photographic Absorption of Lenses
The Importance of the Nodal Points in Lens Testing
A Tilting Tripod Top
Roll-film Development
Developers for the Autochrome Plate
Ammonia with Pyro-soda
The Influence of Hypo in the Metol Developer
A Copying Hint—How to Avoid Grain
Cleaning Hand Stains
Photographic Materials and Processes

THE WORKROOM

By the Head Operator

Photographs on Opal and Ivory

PRINTS upon opal or ivory may be produced in the same way as for watch dials. The only difference for opal or porcelain is that after the plates have been cleaned in a hot soda solution they must be coated with albumen as follows:

The albumen of one egg, one ounce by measure, is broken up with a silver fork in a teacup. One ounce of water is added and one dram of strong water ammonia, beaten well again, then added to one quart of water in a suitable bottle. Shake well, then filter a few ounces of this through absorbent cotton. The opal plate while wet is coated with this weak albumen solution and dried in a rack.

A print is made upon the stripping paper, toned, fixed, washed, temporarily attached to a piece of plain paper and pressed into contact.

The opal plate is then coated with plain collodion (*Solution A*), drained, and as soon as the collodion has set, which takes about half a minute, it is placed in a tray of cold water and allowed to remain until all greasiness has disappeared.

The photograph to be transferred is dipped into warm water as already described and the paper base of the print made to slide off. The moist surface of the print is then placed in contact with the wet collodion surface, a piece of waxed paper placed on top and rubbed down with a soft piece of cardboard. As soon as this is done the back is rubbed down with dry blotting paper and the opal together with the temporary backing is stood up cornerwise to dry. When quite dry the paper backing can be removed with ease if it has not already loosened itself. This very effective print upon opal is now coated with the gum solution, dried and given a coat of Kodalak W. P., although if desired it may be left unvarnished.

To transfer to ivory the ivory is cleaned with a very weak solution of ammonia, then coated with the gum solution, dried and the photograph transferred in the same way as for opal, with this difference: A piece of waxed paper is used in place of plain paper. As soon as the transfer has been made and the excess of water blotted off the ivory, with its waxed paper backed photograph, is placed between two pieces of thick blotting paper in a printing frame on a piece of stout glass and kept under pressure until dry, which requires from 30 to 40 hours. During this time the damp blotters must be changed for dry ones. At the end of this time the backing paper may be removed when the print may be colored as is usual with such pictures.

The next novelty by this process is not so practical but it is a novelty in the true sense of the word: It is the transfer of these miniature photographs to a thumb nail. We often hear of thumb-nail sketches, but these are actual thumbnail photographs.

A miniature photograph, such as is placed upon a watch dial, must be made and it must be small enough to fit the nail nicely. No preparation is necessary except to have the nail clean and lightly scraped to give it a matte surface without polish.

The miniature print having been made ready for transfer, slide off the original paper, then place the photograph down upon the thumb nail, carefully pressing the supporting paper so that a good contact is made. In the course of a minute of two the paper may be removed, and as soon as dry the picture should be coated with the gum solution. When this is dry, coat the nail with Kodalak W. P., dry and coat again. If care is used a picture of this kind will last for several weeks. Care should be used when the hands are washed as such a picture will not stand rubbing. There is little danger from water, however, as the Kodalak makes the picture waterproof.—ALFRED J. JARMAN, in *Photo-Digest.*

One of the Principal Causes of Fading in Photographs, and a Reliable Mountant

WHEN one looks back over a period of about thirty years in the line of photography and examines the various kinds of prints produced, it will be noticed that large numbers of these photographic impressions have not only turned yellow, but have almost disappeared from the paper.

Among the photographs produced in years past, by far the largest number were made upon albumenized paper prepared and sensitized in various ways. There were many ways of making up an albumenizing solution, many photographers adhering to their pet formulæ. In the cases where ammonia was largely used, particularly in preparing the nitrate of silver bath with ammonia nitrate of silver, although prints could be rapidly made upon paper sensitized with such a solution, the paper being extremely sensitive to light, these prints have, in the large majority of cases, faded almost beyond recognition. The plain prepared albumen papers, containing only the chlorides of silver and sensitized upon a plain nitrate of silver bath, are the prints that have withstood the ravages of time far better than any papers treated with ammonia.

The plain salted papers used previous to albumen have in some cases withstood the action of the atmosphere and time, but only when treated and prepared in the simplest manner with chloride of silver and a plain nitrate of silver sensitizer.

In a book published by the late Henry Fox

Talbot, *The Pencil of Nature*, the illustrations were made upon plain salted paper. These prints have withstood the test of time for fifty-one years, and, strange to say, have not faded except where they were held by paste at the corners.

The strength of the nitrate of silver bath used to sensitize this salted paper was 125 grains to the ounce of distilled water, and fixed by prolonged soaking in a solution of sodium chloride (common salt). Hyposulphite of soda as a fixing agent had not been discovered at this early date. It was not discovered that hyposulphite of soda proved to be a fixing agent for papers containing the salts of silver until March 14, 1839, by Sir John Herschel. A point is now reached that proves beyond question that one of the principal causes of the fading of a photograph is due to the paste employed as a mountant. The above-mentioned prints, made by Fox Talbot, prove this, while today it is also well known that the mountant is a cause of fading in collodion papers, as well as many others.

Freshly-made starch-paste has been the mounting material almost invariably employed, yet it is well known that prints of nearly every kind have shown signs of fading in a very short time after being mounted with such paste freshly prepared, while other prints so mounted have withstood well the action of time. Prints by the thousand have faded from the effects of hyposulphite of soda contained in the paper forming the card-mount, this chemical being used as an antichlor, so termed by papermakers to correct the chlorine compounds employed in bleaching many of the white commercial papers.

Assuming that the prints have been toned, fixed, and washed correctly, the most important item required next is a good, reliable mountant. When ordinary starch or flour-paste is used, time and again, when fading sets in, the marks of the brush employed in pasting become visible through the print, and show up in a manner most marked upon the surface of the print. This sometimes happens in the course of fourteen days, the marks being very decided at the end of a month. The writer has albumen prints in his possession, made thirty years ago, mounted with a special starch paste. These prints are not in a faded condition at all. It is not unreasonable to presume that they are likely to last another thirty years, and be in good condition. One of the principal causes of mounted prints fading is the imperfectly-made paste used for such mounting. When the paste is imperfectly cooked a process of fermentation sets in known as acetous fermentation. This will also commence in paste that has been well cooked after a few days. The result will be that if photographs are mounted with such paste, the acid products of the fermentation will attack the organic compound of silver that forms the photographic image. It will make no difference whether the image is in a collodion film or not, fading will set in and the image will eventually disappear.

The following method of making a mountant has withstood the test of many years. Not a print has been known to fade where it has been employed.

In the first place an enamelled iron sauce pan must be kept for paste-making only, of the capacity to suit requirements. Proceed as follows: Pour into a clean saucepan, described above, say 3-pint capacity, 4 or 5 ounces of filtered water. Add thereto 2 drams of salicylic acid. Place the saucepan with its contents over any source of heat, so as to bring the water to boiling point. This is to dissolve the salicylic acid. It will not be necessary to stir this, only to remove the saucepan and shake it around. Add to this 1 pint or 20 ounces of cold water. Weigh out 5 ounces of common laundry starch. Place this in the saucepan; then stir well with a clean stick or silverplated spoon until the starch and water are well incorporated. Place the saucepan over, say, a gas-heater and continue the stirring without intermission until the mass commences to thicken. Now stir rapidly and remove the saucepan. Still continue the stirring for a short time and pour the contents into a clean basin, scraping the remainder of the contents of the saucepan into the basin. Stand aside to cool, which usually takes several hours. When quite cold (not before) lift the thick skin that forms upon the top and throw it away; then wring the cold paste through a piece of clean-washed cheesecloth into another basin or jar. The paste will present a pink appearance. This is of no consequence. All is now ready for use. Paste made as above possesses a structure altogether different from ordinary paste. Its sticking qualities are excellent. No acetous fermentation whatever will take place and no fear of fading. To remove a print when once fixed with the above is almost impossible.

Carbon Prints on Daguerreotype Plates and Aluminum

One of the most beautiful products of the carbon process is a finished print upon a highly polished silver surface, such as that of the Daguerreotype plate. These pictures have already been called the twentieth century Daguerreotype. Although the surface may be matted so as to give a delicate diffused whiteness, the result is not so effective or attractive as the mirror-like surface of highly polished silver. A copper plate may be electro-gilded and polished to a high degree, and the carbon print developed thereon by the single-transfer process or by double transfer, yet the effect is not so pleasing as the silvered surface of the Daguerreotype plate.

Method of Production

The easiest and best method for the production for this kind of print is to employ the single-transfer process. In this case a reversed negative is necessary, and this can be produced in four different ways. First, by a reflecting prism; secondly, by reversing the film, removing it from the negative and remounting it upon a clear glass plate in a reversed position; thirdly, by the use of a celluloid film for the negative, obtaining the reverse by printing through the film, and fourthly, by reversing the sensitive plate in the plate-holder.

If the film must be removed from a glass negative for the reversal, it will be found better to transfer it to a piece of clear celluloid, the surface of which has been well cleaned and prepared by coating with a thin solution of gelatin—ten grains of gelatin to one ounce of water. The stripping of the film from a gelatin negative is easily accomplished by making up the following solution of chrome alum; twenty grains of commercial chrome alum to each ounce of water. Allow the negative to soak in this for twenty minutes to thoroughly harden the film and prevent after-expansion. After this treatment the plate must be well washed in running water for ten or more minutes. When dried make up the following:

Fluoride of sodium (commercial)	½ ounce
Citric acid	¾ ounce
Water	10 ounces

As soon as the salts are dissolved take equal parts of each and mix them in a hard-rubber tray (not glass or porcelain); insert the negative and rock the tray. In three or four minutes the film will pucker around the edges. Now take the top edges of the film with the forefinger and thumb of each hand, lift it carefully from the glass and dip it into clean water; then while still wet lay it down upon the celluloid, the face of the film being reversed. The film is easily adjusted upon the celluloid by means of a camel-hair brush; any air-bubbles may be removed by stroking the surface with a flat camel-hair brush; this will also squeeze out any superfluous water. The celluloid must now be pinned down upon a clean dry board and remain in a horizontal position until dry. In this case the celluloid negative will be printed with the film side direct upon the carbon tissue, instead of printing through the film. The film when once stripped may be transferred to a glass plate in the same manner.

The Silver Plate

Having the reversed negative now ready the silvered plates must now be prepared and polished. The easiest way to procure these plates is to obtain what is known as reflector plate; this is very smooth copper plate silvered on one side ready for polishing—this can be readily done by any electro-plater at a small cost. Take the plates, one at a time, holding them at one corner with a pair of pliers; dip the plate into a solution of potash lye or a strong, warm solution of common washing-soda; rub the surface over in straight lines with a tuft of absorbent cotton pressed into the end of a six-inch piece of india-rubber tube; the rubbing must be done very lightly so as not to scratch the surface of the plate. Rinse the plate in cold water; observe whether the water stands upon the bright surface without showing any greasy appearance—if so the plate is clean. As soon as the plate is washed pour over it a few ounces of distilled water; this forms the last rinsing, the object being to create such a clean surface that there shall be no organic matter or lime left in the few drops that remain upon the surface when drying and thus mark the surface. The plates may now be stood aside to dry, away from sulphurous fumes. If only a few plates are to receive treatment, it will be better to carry out the cleaning as above described, and flood the surface of the still wetted plates with a plain warm solution of gelatin, ten grains of gelatin to one ounce of water, then allow to dry; those that are cleaned and dried without the gelatin coating are to be coated with plain collodion, this being an alternative method of preliminary coating before the printing issue is attached.

Sensitizing is carried out by preparing a bath of sensitizing solution as follows:

Bichromate of potash (c. p.)	1½ ounces
Water	50 ounces
Carbonate of ammonia .	20 grains
Glycerin	2 drams

As soon as the crystals are dissolved, filter the solution through absorbent cotton into a clean, wide-mouthed, amber bottle; this done, pour the mixture into a clean tray (carry this work out under artificial light), and put into it a piece of carbon tissue, about 8 by 10 size portrait brown in color, completely immersing it, face down; then turn it over and brush the surface over with a flat camel-hair brush to remove the air-bubbles; then turn the tissue over again, face down, and allow it to remain for three minutes from the time of the first immersion; then remove it and lay it face down upon a sheet of clean glass 11 by 14; place upon the back a piece of thin India-rubber cloth and apply a squeegee, holding the cloth at one end with the left hand, applying the squeegee with the other; as soon as the excess of bichromate solution has been squeegeed out lift the cloth and wipe the back of the tissue with a piece of soft rag; lift the two top corners of the tissue, insert the tips of two photographic clips, lift the tissue and suspend it upon a stretched wire in a dark room to dry.

If the tissue is prepared in the evening it will be perfect-dry the next morning. No light except a ruby or deep-orange light must be allowed to reach the tissue, as it is now very sensitive. It may be cut into pieces the size required.

The negative must now be masked with a piece of black paper, the hole being cut three inches by four; this is to allow one-eighth of an inch for the safe edge. The piece of tissue, 3¼ by 4¼, is now placed upon the masked negative in an ordinary printing frame just the same as for ordinary sensitized paper, the back adjusted ready for exposure. In exposing take another negative of about the same printing qualities as the negative to be printed in carbon, place upon this negative a strip of sensitized printing-out paper and put the two frames out to print in bright daylight; after a short time turn both frames over, removing the strip of paper as soon as it is about one-third as deep as it ought to be for a finished print. Repair to the dark-room, remove the tissue and place it in a light-tight box, and continue the printing until the required number of prints have been made.

Development

Development may now be proceeded with in the following manner: two trays 11 by 14, made of hard rubber or composition, and two enamelled iron trays the same size are necessary. Make up a solution of common alum, two ounces of powdered alum to twenty ounces of water, and filter; this is best made with hot water and allowed to cool. Place this in one of the hard-rubber trays, half fill the second tray with cold water and immerse the printed tissue in the water; allow it to remain until it lies nearly flat; remove and dip it into a clean mixture of sugar and water, half a pound of sugar in ten ounces of water (in fact, white syrup). Take one of the silvered plates that has been coated with the gelatin solution, wet it in clean water, dip it into the sugar solution and lay it down upon a clean, smooth board, face up; then place the tissue upon it, face down; adjust it in position, cover it with the rubber cloth and apply the squeegee, at first lightly, then increase the pressure, but do not stroke the squeegee too quickly—a slow even pressure is best. Now lift the cloth, lay the plate with its tissue aside and treat the others in the same way, placing a piece of thick blotting-paper between each as they are stacked and allow them to stand for twenty minutes. Then place them in one of the enamelled iron trays containing lukewarm water; let them remain in this for five minutes; take one of them and dip it into the second tray, containing water somewhat hotter. In a short time the coloring matter will be seen to ooze from the edges of the plate. Now take hold of one corner of the tissue and lift it carefully off the plate beneath the water; throw this into the waste box and proceed to develop the print upon the plate by holding in the left hand while in the water, and throwing water over it with the right. The temperature of the water must be kept up by the addition of more hot water. In the course of a few seconds the print will be seen to stand out upon the plate, and in the course of about one minute the development will be complete.

The print now must be washed in a soft stream of running water and placed in the alum bath for one minute. It is then rinsed again carefully under the faucet and laid to soak in a tray of clear water for a few minutes or so to get rid of the excess of alum. It must now be rinsed for a few seconds under a stream of water and stood in a clean rack to dry. The other plates that have been soaking in the warm water can be taken in hand in the same way, in fact they must not be allowed to remain in the warm water too long before removing the tissue, as the plates are liable to become marked.

The effect produced is charming in every particular. Before you is a picture with all the beautiful gradations of tone as in the Daguerreotype, the shadows being semi-transparent, the beautiful reflection of light in the high-lights from the bright silver surface beneath, and above all there is an absolutely permanent picture upon a silvered surface. As soon as the print is perfectly dry it can be spotted if necessary and then varnished with a clear varnish, the formulæ for which will be given herewith. Do not use a chrome-alum bath for the semi-hardening of the print, this salt being liable to make the film too hard and cause it to crack; use the common powdered white alum.

In employing the alternative process, where the plate has been cleaned and dried, about half a pound of plain collodion will be required. In this instance the plate must be coated with collodion by pouring a pool on the centre of the plate and allowing it to run to each corner; then drain the excess back into the bottel. In the course of about half a minute place the plate, face up, in a tray of clean water; allow it to remain until the ether and alcohol are washed out, then place the wetted carbon tissue in the same manner as described for the plate with the gelatin coating, only in this case the use of the syrup may be omitted, all the after-operations being the same as described.

Aluminum Plates

In the case of aluminum, the sheet metal, which need not be thick, should be procured already frosted, and if a special size and shape of plate is required, perhaps with burnished edges, then it will be advisable to get the plate cut to shape, and have it frosted or matted by an electro-plater. In making portraits on aluminum, the metal must be cleaned in a warm solution of common soda to get rid of any grease spots, because the solution of potash lye, especially if very strong, is liable to attack the aluminum, this metal being acted upon vigorously by the caustic alkalies of potash and soda. All that will be necessary in the use of aluminum, after cleaning and rinsing, will be to dip it in the syrup and the printed carbon tissue as well, after soaking it in cold water until it lies flat, and squeegee them together as in the silvered plate, not attempting to develop until the two have remained together for twenty minutes or more. Development may then be proceeded with in the same manner as the silvered plates.

The collodion used in this process is not the enamel collodion—this is too thick—the collodion required is thinner; so that if enamel collodion is the only kind procurable it must be thinned with a mixture of equal parts of pure alcohol and sulphuric ether. A clear, hard varnish suitable for the coating of these carbon prints upon metal can be made as follows:

Clear celluloid . . .	25 grains
Concentrated amyl acetate	6 ounces

Cut the celluloid into strips, place the above into a clean dry bottle, stand this in water which must be brought to boiling point, a piece of folded paper between the bottom of the bottle and the pan to prevent the bottle from cracking. The mixture must be shaken well several times and the bottle allowed to remain in the hot water to cool down gradually. In the course of about six hours the celluloid will have become liquefied. The mixture must be shaken well to insure complete incorporation. This preparation will present the consistency of castor oil and may have to be thinned down slightly, which is accomplished by the addition of an ounce or two of the concentrated amyl acetate; this preparation is known under the name of crystalline. The surface produced by this preparation is exceedingly tough and resistant; a photograph upon metal or glass when coated with this varnish becomes quite waterproof. It is applied by pouring upon the plate the same as described for collodion.

The drying may take place by spontaneous evaporation at ordinary temperature, or may be aided by heat. The first method is the best. Another waterproof varnish may be made by mixing the following, in this case no heating is required:

Concentrated amyl acetate	6 ounces
Pyroxylin (gun cotton) .	240 grains

Shake the mixture well, nearly the whole of the pyroxylin will become dissolved, filter through a piece of cheesecloth pressed lightly in the neck of a glass funnel; repeat this operation twice. The varnish is now ready for use.

In using these preparations, pour only a small pool of the liquid upon the plate, give it time to flow to each corner. This will prevent the overflow at the edges, the varnish being more viscous than ordinary colloidion; while if it is too thin the surface will show up in prismatic colors. In this case the plate must be varnished twice.

The Sulphide Toning of Bromide Prints

PROCESSES of sulphide toning may be divided into two general systems, one being distinguished as direct, and the other as indirect. In the former the toning is effected by the simple immersion of the print in a solution in which it is left until the desired result is obtained. Hypo-alum toning is one such method, but this will be treated later in a special article, and for the present we shall only touch on one other direct method Indirect methods involve the use of two or more baths, one of which is usually a bleaching solution, and these methods being perhaps more used than any others are generally the ones meant when we speak of sulphide toning.

Whatever method is used, whether direct or indirect, we must of necessity start with a good bromide print as a foundation, and a print suited to sulphide toning must have certain qualities which are not necessarily essential in an ordinary black tone print to be preserved untoned. There is a considerable degree of latitude in bromide paper, and a good black print can be produced in several ways—that is to say, of two prints, each good in its way, one may have received a brief exposure and been developed up to its limit, while the other has been exposed for a longer time and development has been stopped before it went too far. As they are, either print may be quite satisfactory, but for sulphide toning only the first one is of use in producing really fine results Properly treated, it will give rich brown tones, while the other at the best will only give poor, feeble browns It is therefore essential to adjust the exposure, in the first instance, so that prolonged development up to the limit will yield a satisfactory print. As bromide paper develops rapidly, in any case three to four minutes may be looked upon as a long time, it is a safe general rule to adjust exposure so that full development may be reached in *not less than* three minutes. If it is necessary to snatch the print out of the developer in two minutes to save it, we can feel certain that the print will be of no use for sulphide toning, though it may make a very passable black print.

It must also be remembered that a print of the right quality can be produced only from a good clean negative free from fog. A negative of the kind that will either enlarge well or give a good carbon print is the type to aim at. Thus if sulphide toning is intended, we must keep the fact in view from the very beginning of our photographic operations if good results are to be secured.

The most usual and most general process of toning consists of first bleaching the print, and then following with a solution of sodium sulphide. Many bleachers are available, but the best and most convenient for general use is a solution containing potassium ferricyanide and either potassium or ammonium bromide. The following is a good formula:

Ammonium bromide . .	100 grs.
Potassium ferrocyanide .	300 grs.
Water	20 ozs.

The print is immersed in this, and when bleached is washed for a minute only. It is then covered with a solution of sulphide made as follows:

Stock Solution

Sodium sulphide (pure white crystals)	4 ozs.
Water	20 ozs.

Take three ounces of this stock solution and make up to 20 ounces for use.

A few seconds in the sulphide bath will give a full brown tone, and then the print is well washed and dried. The washing after fixing and before bleaching must be very thorough, and some workers claim that better tones are secured when the print has been hardened in chrome-alum, or when the chrome-alum acid fixing-bath has been used. It is advisable to harden in warm weather, but whether the hardening really affects the tone is somewhat doubtful.

Many variations of the method as described have been suggested from time to time, but only two or three are really worth consideration. The first of these is the use of a thiomolybdate toning bath in place of the plain sodium sulphide. This thiomolybdate toner is a patent preparation sold by Edmond & Co., and the resulting tone is a rich brown of a purplish tendency. Another special "tabloid" preparation is the thiostannate bath, sold by Burroughs, Wellcome & Co., which gives a good umber brown.

Sulphide Toning

PROBABLY the chief reason for the use of the sulphide or redevelopment process is that cold solutions are used and it is generally considered easier than the hypo-alum method. The chief trouble with it is that one can never be quite certain as to the tones that will be obtained, and all sorts of bleach have been suggested to obviate this. The real cause of the trouble lies in the exposure and development. If the exposure is prolonged, so that development has to be stopped early, then unsatisfactory yellowish tones are obtained; while if the exposure is so adjusted that development is not complete in less than two and a half minutes, rich tones can be obtained every time; further than that, it seems then as though it is perfectly immaterial what the actual developing agent is. A flat, thin, foggy print will never give a good tone. As a matter of fact the print should be developed so far that, as a black and white, it is hopelessly overdeveloped, and there should be no actual whites even in the high-lights. The sulphiding so lightens the tones that an underdeveloped print will look weak and washy. A print that is overdeveloped, with all its shadows blocked up, will when sulphided show details even in the deepest shadows, as the brown is so much more transparent and luminous than the black.

I have not found that there is one paper more suitable for this process than another; though those with buff supports look better. I have found that some papers are more prone to blister than others. The remedy for this is a chrome-alum fixing-bath.

All sorts of formulas have been given for the bleaching bath, and frequently it is recommended to bleach the bath right out. I do not believe in this. It is all right if you want bright yellowish colors; but some of the finest tones I have been able to secure are from prints that have been so superficially bleached that only the fine details in the highest lights have disappeared. One has then a main image in black silver and superimposed on that a superficial film of yellow silver sulphide, and the two give a particularly rich tone that cannot be obtained by any other method.

The usual bleach is a mixture of ammonium bromide and ferricyanide, but I think that much finer tones are obtained with the following:

Pottassium iodide	5 gm.
Potassium ferricyanide	15 gm.
Water	1000 c.c.

This bath is about half the usual strength, but it is made so on purpose. It ensures quite even action and it works so much slower that one can stop its action at any desired stage.

A very instructive experiment is to make half a dozen prints all alike from the same negative, immerse them in the bleach for various times, mark on the backs the time of bleaching, then cut the prints in half after washing and sulphide only one-half. One has thus a record of how a print should look to obtain any particularly striking tone and also a record of the duration of the bleaching.

One factor, which is often neglected, is the temperature of the bleach. It is a well-known fact that all chemical reactions take place much more rapidly the higher the temperature. If regularity of tones is required, then a constant temperature and a constant time of bleaching is essential. Some operators claim that drying the print before bleaching is an improvement, but this I cannot personally confirm.

What is most essential is a thorough washing after fixing so that every trace of hypo is removed from the print and image. If this is not done, one has formed in the print surface the well-known Farmer's reducer, and the print loses considerably in vigor with the consequent result of poor tones.

The redevelopment bath may be any soluble sulphide, but the sodium salt is the simplest. It is the cheapest chemical that we can use, but my advice is to purchase only the purest—that which is used as a chemical reagent; it costs twice as much, but it is 98 per cent. pure. It is bad stuff to keep, as it rapidly absorbs water from the air and spoils. The best thing to do is to dissolve it as soon as purchased in three times its bulk of water, and store in tightly corked bottles. For use, one part of the above may be diluted with five parts of water, the prints immersed one by one, and the batch left with an occasional turn over. The time of immersion in this bath seems perfectly immaterial; five seconds or fifteen minutes seems to make no difference to the tone, though too long will cause blisters in the subsequent washing with some makes of papers. Too long washing after the bleach will also cause these, and actually a wash of two minutes in running water is quite enough and better tones seem to be thus secured.

Some operators prefer liver of sulphur, rendered alkaline with ammonia; but this, which is a potassium salt, presents to advantage over the sodium salt.

The only process in which I have found the potassium salt useful is in the direct toning process, which may be said to be a variant of the hypo-alum bath. After fixing and washing the prints should be hardened in a 5 per cent. solution of chrome alum for five minutes, then washed for one minute, and immersed in the following:

Liver of sulphur	6 gm.
Water	1000 c.c.
Ammonia, a few drops	

The temperature of the bath should be 105° F. A very rich brown is obtained in a very short time.

Enlarging

A GOOD enlargement will often procure an order, and I make it a practice to occasionally make one from a good portrait merely on speculation. If not sold it is hung on the reception-room wall.

The following is my method of enlarging, which possesses no particular novelty, but some visitors who have seen it have thought it worth while to copy. I use no lantern, yet all my enlargements are made in the dark-room by artificial light.

I have cut in the wall of the dark-room an aperture that will take a 10 x 12 plate, and a local carpenter made a series of kits that will fit in this aperture snugly, one for every size plate down to 2½ x 3¼. Inside the dark-room is a wooden shelf, supported by stout iron brackets, which fold flat against the wall, and the shelf also drops down so that everything is out of the way till wanted. On this shelf is placed an old studio camera that has seen its best days and had been relegated to the lumber room. The lens is an old rapid rectilinear that did good service but has been supplanted for studio work by an anastigmat.

The source of light is a piece of tin bent to the arc of a circle and painted inside with dead-white enamel. This is the actual source of light as regards the negative, but actually the lights are two of the nitrogen-filled Mazdas, each 100 c.p. These are placed one on each side of the aperture and a piece of tin prevents any direct light from reaching the negative. If the tin is brought to the proper curve there is no necessity for using any diffusing medium, such as ground or opal glass. And the tin should also be brought round behind the lamps so that it acts as a reflector.

One great advantage of this arrangement is that there is no heat in the dark-room, and naturally there is no necessity to enclose the lamps. Naturally one could use one of the regular enlarging lanterns or even a stereopticon for illuminating the negative, but if the latter be used with an arc, a piece of ground glass must be placed between the arc and condensor to obtain equality of illumination.

Artificial light is far superior to daylight. It is more constant and it enables one to work at times, as in the evening, when daylight is not available. The exposures are never so long as to be a serious objection. I find that mine run about 60 to 90 seconds.

I use no easel for supporting the bromide paper, but an old 20 x 24 printing-frame, into the front of which is firmly puttied a sheet of plate glass. I first used a sheet of cardboard, marked with the various sizes of papers, but I found this a nuisance as it was difficult to keep the paper in its exact position when putting it into the frame; so I bought some sheets of black paper and cut them down to fit the frame, and in each sheet was cut an opening just large enough to take a given size of paper. These are laid on the glass, the sensitive paper slipped into place, and then a sheet of thick piano felt laid on top and the back put in. I have found this answers perfectly and never have the paper slip out of place. If, however, I want an unusual shaped print, and this sometimes happens, then I mask in front of the glass with strips of the black paper which are temporarily fastened to the frame with push pins.

Focussing is done on the sensitive paper itself, in all cases, and this is rendered possible by using a cap of yellow glass. This was also home-made, from an old lens-cap, and the glass is part of a fixed-out, well-washed dry plate that had not been exposed. The plate when dry was immersed in a 1 per cent. solution of tartrazine, a bright yellow dye, for half an hour and then rinsed and dried, and the front of the lens-cap was cut out and the rim glued to the glass, which was varnished with celluloid varnish to protect the dyed film. This gives a brilliant light that is perfectly safe and enables one to focus perfectly.

Let me add that a great deal of my outdoor work is now done with a 2½ x 3¼ pocket camera and then enlarged. So far as I am concerned, the day of the big camera has gone. This saves weight and cost of big plates. I use carriers and cut-up 8 x 10–Kodak portrait films.

Washing Plates and Prints

PROBABLY there are more different kinds of plate and print washers on the market than any other kind of apparatus; some are efficient and others are—well, let us say—less so. When one has an unlimited supply of water and does not have to pay for it, undoubtedly running water will do the trick, provided certain precautions are taken, in a reasonable time.

Naturally, when one has to deal with plates, a grooved tank is a great convenience, as it saves considerable space; although really placing plates in a large, flat dish, and tilting this up so that one end is a little higher than the other, and directing the water along the upper edge, will really wash plates quicker than the average trough. Some troughs have a connection to a water tap, so that the water issues a fine spray between the plates. Theoretically this should be the most efficient; but my experience of this type is that the plates become very rapidly covered with innumerable air-bubbles which cling most tenaciously to the gelatin, and really prevent the access of the water to the film. I soon abandoned this type of washer and just let the water run down the rubber tube to the bottom of the tank and the surplus out of the top.

Some years ago I was told that the only way to wash plates properly was to soak them five minutes, empty the tank, then soak again, and repeat the operation twelve times in an hour. The man who told me suggested that I pour an ounce or two of old, dirty, pyro developer into a tank and try both methods. I followed his advice and found that it took just four times as long to entirely remove all trace of color from the water by a continuous flow through the tank as it did when the water was changed every five minutes. This, then, is the practice that I have continued ever since. It is not much trouble and certainly the negatives are thoroughly washed. I do not use any siphon or tap in the tank. It is just tipped up bodily and the water emptied out as quickly as possible and filled up as quickly as possible.

Where there is plenty of room, and quantity of water used is no object, then a series of trays, one under the other, is very efficient. Any carpenter can make these; as a matter of fact, I made mine myself out of some old lumber, and they are, I may say, used only for small plates—nothing larger than 4 x 5. The top board has an edge of one-fourth inch moulding on each side, and at every five and a half inches are driven into the bottom board two brass picture-tacks that are just long enough to project above a plate. I have five boards, one over the other, each two feet long and the boards are sloped in alternate directions, the actual drop being two inches in the two feet. The water runs over the top board and its four negatives onto the second board, which projects an inch beyond the first, so that all the water must run down the second board, and from this onto the third, and so on. The negatives placed on the top board I have found to be washed enough, with quite a slow stream of water in thirty minutes. They are then removed; those on the second shelf moved up to the top shelf, and those on the third moved up on to the second. As I have six such shelves, I find I can wash twenty-four 4 x 5 plates in about two hours.

Now there is one point which, as far as I can find out, very few photographers take any notice of, and it is whether the water they use is clean or dirty. My experience has been that there is no water that does not carry small particles of suspended matter or dirt, which settles on the gelatin film and is not removed by mere washing. It is as well, therefore, to use a tuft of absorbent cotton; pass this over the surface of the negative film while the latter is held under the tap, then squeeze the bulk of the water out of the cotton, and pass lightly two or three times over the film so as to remove the excess of water from the film. This enables one to dry the film much more rapidly.

When we come to the question of washing prints, we have a totally different set of conditions. Here we have a support which is porous, while in the case of a plate or film the support is not porous, and therefore in the former case the hypo can be removed from the back as well as the front of the print, but in the case of the plate or film it has only one surface to exude from. Naturally, one might say, that as the paper is porous it must absorb some hypo solution, and this must be admitted; but the gelatin film of a print is very much thinner than that of a plate, so that as the hypo can diffuse from the paper the print ought to be more quickly washed—and it is.

Many of us can recall the old days when albumenized paper was the only one that we had and we washed our prints for hours—in some studios even all night was not thought too long—but we are saner now. Yet there are probably few who know how little washing is actually required to free a print from hypo. Twenty years ago it was proved by Haddon and Grundy, two English chemists, that ten minutes' washing in running water would remove all the hypo from a gelatino-chloride print, and the paper they used had a much heavier coating of baryta gelatin than is ever used at the present day for the so-called development papers. Long washing of prints, therefore, is quite unnecessary.

The most striking of all experiments on the washing of prints were those of Lumiére and Seyewetz; so striking were they that few believed the facts, yet they have been confirmed. These chemists stated that if a pint of water was allowed for every square foot of print, the print soaked for five minutes, then drained and squeegeed, and the operation repeated eight times, the print would be thoroughly washed. They proved that if a 5 x 7 print is soaked in successive changes of water, the total consumption being about a quart, that it is more efficiently washed than if twenty gallons of running water were used.

Such a statement as this is almost incredible, but it is at least worthy of credence, and should show us that repeated soaking, draining, and squeegeeing is the most satisfactory and economical way of washing. One need not squeegee each print, a dozen or more can be piled one on top of the other, and a heavy roller squeegee passed over them two or three times. For some years I have adopted this method and found it eminently satisfactory.

An Iron Developer for Plates, Films and Paper

Since the introduction of hydroquinone, metol, eikonogen, amidol, and many other developing agents, nearly all being the derivatives of the coal-tar compounds, the once photographer's friend, ferrous oxalate, appears to have been quite forgotten.

There have been many variations of this valuable developer, none of which surpassed the plan of dissolving the true ferrous salt in a strong solution of potassium oxalate. More iron and developing power can be secured by this method than by any other, for the simple reason that the solution of potassium oxalate is not overloaded with other products of chemical decomposition. A solution of ferrous oxalate in potassium oxalate, possessing the greatest developing capacity, is to be made by making a hot solution of potassium oxalate, and dissolving therein as much ferrous oxalate as it will take up; in other words, this method produces a saturated solution, which may be made acid with various acids, or it may be modified so as to produce a different color by the introduction of either ammonium bromide or potassium bromide, or it may be used in a perfectly neutral state. This developer must not be used in an alkaline condition; should this be attempted, the exposed plate will become fogged, and a thin image will be the result.

The question now is, where can ferrous oxalate in its true state be obtained? Like many other salts that were, and still are, used in photography, they can only be obtained of the wholesale chemist. Oxalic acid, which is necessary for the production of ferrous oxalate, can be purchased at any drug store, while protosulphate of iron would have to be purchased in quantity of the wholesale chemist. At the present time, 1915, the price of oxalic acid has gone up considerably. In the wholesale line, the price increased from nine cents per pound to thirty cents; while all the salts of potassium have also gone up in price. The photographer, today, could not in his ordinary way of business make oxalic acid, the process being too intricate. The base from which oxalic acid is made today is just common sawdust, the same kind that is used to sprinkle the floors of warehouses. Before this discovery was made, oxalic acid was produced from sugar; this, however, was too expensive. It is not the intention of the writer to go into the manufacture of oxalic acid. The method of making ferrous oxalate will be described, because the materials can be purchased readily anywhere in small quantities, which would enable the photographer, professional or amateur, to prepare ferrous oxalate with ease and at a small expense, and from this chemical, when made, to make a developer that will produce negatives upon plates and films and prints upon paper that will rival the more modern developers. It may be mentioned here that the action of this developer is not so vigorous as the various developers made with metol and hydroquinone, although it rivals the latter salt in speed action, and, like hydroquinone, development must be carried farther in its reducing action so as to allow for the drop in density when the image is fixed in a chrome-alum-hypo fixing-bath. Lantern slides may be developed with this particular developer readily, which will produce results like pyrogallic development, if a few drops of a 10 per cent. solution of bromide of potassium be added previous to commencing development. The high-lights of a transparency developed in this solution will present bare glass, and if the color is not quite to our liking it may be changed by any of the methods employed for the color changing of lantern slides.

How to prepare ferrous oxalate: In the first place, two stoneware jars or crocks will be required of one gallon and a half capacity each, either with or without lids; they must be well cleaned with hot water. Then procure 1 pound of oxalic acid and 2½ pounds of proto-sulphate of iron; dissolve the proto-sulphate of iron in one gallon of filtered cold water, preferably distilled water; now dissolve the oxalic acid in half a gallon of water, also cold. As soon as these salts are dissolved, which will be aided by considerable stirring (the mixing must not take place until the salts in each crock are dissolved), then pour the oxalic acid solution into the proto-sulphate of iron solution; stir the mixture well with a strip of glass or a stick of white pine; then in the course of half an hour stir the mixture again well. It will then present a very turbid or muddy appearance. The mixture must now be allowed to stand undisturbed for twelve hours. At the end of this period the clear liquor standing above the precipitate must be decanted carefully so as not to lose any of the precipitate, or it may be drawn off with a siphon and thrown away. Upon examination there will be found at the bottom of the crock a copious, pale-yellow precipitate, very much like a mixture of mustard and water, but very different in composition. This precipitate is *ferrous oxalate*. This precipitate must now be washed by pouring upon it two pints of filtered water. Stir the mixture well, allow it to settle (which will take about three hours), pour the clear liquor off again, add another quart of filtered water, continue the same process, when the clear, faintly yellow liquor must be again poured away, and the precipitate poured into a large filter-paper in a glass funnel with a piece of absorbent cotton, pulled out cobweb fashion, placed at the apex of the filter-paper. This precaution is necessary to strengthen the filter-paper at this part to prevent breaking. The crock must now be rinsed with cold water, the rinsing being poured into the funnel. As soon as the liquid has passed through the filter, the funnel may be filled to the brim with distilled water and allowed to filter until no more water passes through. The whole mass may then be lifted by the filter-paper and laid down upon other absorbent paper, in such a way that the filter-paper holding the precipitate may be opened and the contents exposed. In this way the whole mass may be placed in a warm place to dry, resting upon clean cardboard. The iron receptacle over an ordinary kitchen stove, where the pots and kettles are kept, or the plate heater, will be found to be just the thing. As drying proceeds, say at the end of a day, the whole mass will be stiff enough to handle. Then withdraw the wet blotter and cardboard and substitute another set. In the course of about twenty-four hours the precipitate will be perfectly dry, and the mass, although it may appear to be very lumpy, may be easily crushed because of its friability. The resulting yellow powder is the ferrous oxalate of commerce. Upon weighing the powder, it will be found that there is just about one pound and two ounces, or, should there have been some loss in the operations, a full pound of sixteen ounces will have been acquired in a thoroughly dry state. To make up a powerful developer with this chemical, prepare the following solution:

Hot water	60 fl. oz.
Neutral oxalate of potash .	16 oz. av.
Bromide of ammonium .	20 grains

Now add as much of the ferrous oxalate powder as the hot liquid will take up or dissolve, which will be about three ounces; stir the mixture with a glass rod and add three drams of acetic acid No. 8. The resulting liquid will assume a deep yellow color, bordering upon red. As soon as it is cold enough pour this liquid into a wide-mouth, amber-glass bottle close up to the cork; then, when it is quite cold, it will be fit for use to develop plates, films, or paper.

The description given may appear to indicate a tedious process; this will be found, however, not to be so. All the operations are quickly performed, to say nothing of the pleasure and correct knowledge obtained in producing the material. Occasionally the image may appear to be slow in starting up compared with metol and similar chemical substances; the result, however, will be perfect. When paper is developed, the shorter the time of exposure the blacker will be the resulting print, while if the time of exposure has been a little too much the print will assume a brown color. The writer has obtained with glossy papers, beautiful prints, both in black and brown.

The usual acid water is required between the developing solution and the fixing-bath; this stops development and aids in preventing fog.

After the fixing of the image is complete and the prints have been washed, the whites may be made very brilliant by passing them through the following clearing solution:

Water	30 fl. oz.
Common alum	2 oz. av.
Citric acid	1 dram

If there is the faintest trace of discoloration in paper prints developed with the above developer, this clearing solution will remove it rapidly, the blacks becoming improved at the same time.

This developer may not be suited for *all* kinds of paper, owing to the variable components of the emulsions, but for bromide and chloride developing papers it has yielded prints of unsurpassed beauty. A separate solution should be kept for negative work, and another for paper prints. A 10 per cent. solution of bromide of potassium will be found useful for restraining purposes; it acts with more vigor than the bromide of ammonium. The latter salt answers every purpose with this developer, and for that reason it has been included in the makeup.

The ordinary acid hypo fixing solutions may be used, but they will reduce the image slightly, so that development must be carried a little farther to counterbalance this tendency. The developer may be used several times over, if returned to a bottle well-corked and filled nearly to the top. The ferrous oxalate in a dry state will keep without deterioration for any length of time, if kept away from the air in a well-corked or stoppered bottle, and be ready for use at any time for making new developer.

The Bromo-Iodide of Copper Intensifier

THE objections to the usual mercury-ammonia intensifier are many. The density of the finished result is uncertain, spots and pinholes may appear in great numbers, while the permanence of the intensified negative is a matter of doubt.

A blackish colored deposit is rarely so non-actinic as one of a reddish color, and for this reason I prefer to have negatives of a reddish or yellowish tinge rather than pure black and white, such as that usually obtained with mercury and ammonia or by direct development with developers other than pyro. Pyro when used with soda or ammonia, more particularly the latter, gives negatives of a good printing color; they are not "pretty," like those obtained with, say, hydroquinone or any of the newer developers, but they give better results, particularly on P. O. P.

Once upon a time I used the uranium intensifier, which not only intensified the image, but stained it to a good reddish-brown color; but the uranium intensifier at its very best is unreliable, and is apt to increase the coarseness of the grain in the plate.

The bromo-iodide of copper intensifier is better in every way than the uranium, although perhaps a little more expensive and troublesome to make up. But it may be used for bromide papers and lantern slides as well as for negatives. With all it has a toning action just as uranium, and is far more reliable.

There appears to be a belief among amateurs that intensification of any kind is a sort of cure-all for underexposure, but this is not so. The effect of intensification is to increase the contrast, or the light and shade—the very qualities that are usually prominent in underexposed plates. No after-treatment of the film of a developed negative can possibly replace the action of light, and produce details when the exposure given has been altogether inadequate. It is with overexposures, where the detail is full and the contrasts are weak, that intensification is of the greatest value.

With the bromo-iodide of copper intensifier, as with most of the others, it is absolutely necessary that the developed negative should be very thoroughly fixed and washed. A thorough washing is of little use unless the negative is thoroughly fixed, preferably in a newly-made hypo bath. An intensifier by itself rarely causes stains, the latter being always traceable either to imperfect fixing or to improper washing, probably in most cases to both.

In order to "make assurance doubly sure," as Shakespeare says, I often take the precaution to use two fixing-baths, and after what is supposed to be a good washing I immerse the negative in a saturated solution of alum, and wash again in running water for twenty minutes.

The bromo-iodide of copper solution may be made up in any quantity, taking the following formula as a foundation:

When dissolved the following iodide solution is added slowly and with constant stirring:

Potassium iodide	8 gr.
Potassium bromide	20 gr.
Water	1 oz.

If it is properly mixed, a slight deep-yellow-colored precipitate will form. It is then filtered or allowed to settle, as only the clear portion is required for use. The solution keeps well, and may be used over and over again until it refuses to work properly. It is, however, advisable to strengthen it now and then by adding about 5 grains of potassium iodide and 15 grains of potassium bromide dissolved in 1 ounce of water. The negative, if dry, should be soaked to soften the film; it is then placed in the copper-iodide mixture, as above, the operation taking place in the strongest light possible. The negative bleaches rapidly, and it should be allowed to remain until the film becomes a canary yellow color all the way through, and even in character. When viewed by transmitted light, the shadows should appear clear, and the stronger the daylight when the negative is bleached the clearer the shadows appear to be. The average time of bleaching is ten minutes.

The yellow negative is then removed from the bleaching solution and washed in water for a quarter of an hour, but no longer. It is then ready for darkening. As with a mercury bleached plate, the darkening may be accomplished in many ways, the color of the darkened image depending on the state of the original image to some extent, but very much more upon the means employed for darkening.

A good darkener for blackish tones is a strong solution of sodium sulphite in which a few grains of silver nitrate have been dissolved, but the charm of the process is the various colored images which may be obtained by darkening the bleached image with old or new developers, redevelopment taking place in all cases, as did the bleaching, in the strongest light obtainable. All developers that I have tried, except eikonogen, I have found give good results. But, with one exception, the color of the image is a grayish black. The exception is hydroquinone, made up as follows:

Water	4 oz.
Sodium sulphite	½ oz.
Sodium carbonate	60 gr.
Potassium bromide	3 gr.
Hydroquinone	50 gr.

The color of the redevoloped negative is, as stated above, strongly affected by the composition of the developer, and it varies a little, but not much, with different plates. This formula gives a kind of claret-colored image as a rule, or a rose red, which is very non-actinic, and makes a good printing negative. By increasing the sodium sulphite and hydroquinone, darker shades of red and brown may be secured up to a good black.

A white porcelain dish should be used for the darkening process, or, if a black one is used, it is advisable to place a sheet of white paper under the negative, in order to reflect the light, because the stronger the light the better the result. The developer is allowed to act until the film is developed through and the image is of the required shade. It is then washed and dried in the usual way.

Negatives intensified in this manner keep better than those treated with mercury or uranium, and apparently undergo no greater deterioration by the action of the atmosphere and time than those which have not been intensified.

Bromide prints are intensified like negatives. In bleaching the print, however, the paper will perhaps assume a bluish tint, from the formation of iodide of starch; but this will disappear when the hydroquinone developer is poured on. The picture then develops to a sepia color, the exact color varying somewhat according to the strength of the image before intensification, the composition of the developer, and, to some extent, also upon the strength of daylight in which the operations of bleaching and redevelopment are carried out.

When using the process, more particularly with negatives and lantern slides, it is important to bear in mind that the picture to be treated must be quite free from fog.

Matt and Glazed Portraits by the Carbon Process

Making carbon portraits in 5 x 7 or 6 x 8 sizes by the usual double transfer process, employing a flexible support to develop the prints upon, always gives a dull or semi-matt appearance but not a complete matt surface, one that should give no semblance of gloss.

By a slight manipulation of the Lambertype process a matt surface can be obtained, and, as two methods are available, I shall describe them as used in my general practice, which may prove of service to other photographers. The whole process of carbon printing will not be gone into here, because it is assumed that the readers are acquainted with the process.

The formula for the sensitizing solution is given, owing to its having answered well for the purpose, therefore it can be depended upon for all the usual kind of work in demand for good ordinary negatives, and as the tissue when sensitized with it will dry, and be fit for use in less than four hours, oftentimes it will dry in less than two hours, which in cases of hurry-up orders gives an advantage.

Sensitizer

Warm water	50 oz.
Potassium bichromate (powdered)	3 oz.
Ammonium carbonate	1 dr.
When cold add alcohol	20 oz.

The sensitizer must now be filtered and kept in a covered stoneware jar or a wide-mouthed brown colored glass bottle, when it will be ready at any time for sensitizing the tissue.

Preparing the Plates for Matt Development

The best kind of plate to form the matt surface is the fine emery-ground glass, such as is used for focussing screens of the camera, or emery-ground opal glass plates. Although the latter are more expensive than the former, an advantage is gained by the use of these in enabling the exact quality of the portrait to be easily seen before the final transfer. When using the camera screen plate some practice is required to decide at a glance, by reflection from a dead-white surface, the correct depth for a finished print. This is not a difficult matter; it is simply acquired by practice.

The plates, which may be 5 x 7, are washed in warm water, to which a piece of carbonate of ammonia has been added. About the size of a walnut, in half a gallon of water, has been found to answer the purpose. This will remove any greasy finger-marks or adhering dirt without injury to the hands. The plate, while still wet, must be rinsed in a stream of water and placed in an ordinary negative rack until dry.

Stripping Medium

Pure white wax	15 gr.
Ether (sulphuric)	5 oz.
Pure benzole	½ oz.

A small quantity of this must be rubbed over the ground surface of the plate and polished off with light rubbing. Treat all the plates required for the work with this stripping medium and coat them with the following collodion, and as each one is coated place it into a grooved washing tank of cold water.

Film Collodion

Alcohol (pure)	5 oz.
Soluble cotton	50 gr.
Ether (sulphuric)	5 oz.

This collodion must be filtered, to separate any cotton fiber, or, if time permits, let it stand undisturbed for a week, and pour off the clear portion for use.

The tissue of any appropriate color, having been exposed, may now be steeped in cold water until it lies flat. One of the prepared plates is now slipped beneath the tissue, the two are lifted together, and brought into complete contact by the use of the squeegee.

In the course of half an hour development in hot water may be proceeded with. As soon as the development is completed the plate must be washed in a stream of cold water, treated with the usual 5 per cent. alum bath, washed again and dried. The remainder of the process being the same as for double transfer, the prepared paper for the final support being softened in hot water, the dried plate having been allowed to soak in cold water for half an hour, the two are squeegeed together and allowed to become quite dry. The print is now separated from the glass plate by the insertion of the top of a penknife at one corner, and lifted off, when it will be found to possess the exact matt surface of the plate.

If glazed prints are wanted, all that one has to do is to use polished plate instead of the ground variety, all the other operations being the same, when a print possessing a very fine transparent gloss will result.

The employment of grained zinc plates has been advocated by some workers. The use of these is not advised, for should they at any time become scratched in the routine of general work they are then irreparably ruined and cannot be utilized again: while glass, either the kind used for focussing screens or finely ground opal, possesses no such objection. The only objection that can be urged against the use of glass as a temporary support is its liability to breakage. With careful handling this forms a very remote objection and should it occur in many instances a 4 x 5 plate can be cut from a 5 x 7 and still be brought into use.

If a print made as described should prove to be a little too weak, it can be easily intensified and utilized by using this intensifier.

Intensifier for Carbon Prints

Potassium permanganate	100 gr.
Water	5 oz.

Immerse the plate and watch the depth of color. As soon as this is reached, remove the plate, wash it well, dry, and follow with the transfer paper in the same manner as for the others.

The collodion film described will form a good protective coating to the print, either for the matt or glossy surface.

The following process which is the second way of securing a matt surface, can also be employed successfully, only in this case the use of rosin and beeswax is necessary, the plate being rubbed over with talcum powder in the first operation and finished with the wax solution described.

Resinized Solution

Yellow rosin	50 gr.
Pure beeswax (use no imitation)	50 gr.
Benzole	5 oz.
Spirit of turpentine	5 oz.

This will take about a day to completely dissolve, when it may be used upon a soft piece of rag, using only a few drops, rubbed well over the talcumed surface, and polished with another soft rag, by light rubbing.

The exposed and well wetted tissue is applied directly upon the plate, squeezed down, allowed to stand for half an hour as in the last method, and developed in the same way, finishing the operation with the double-transfer paper and drying in the same manner. As soon as dry the print may be removed, as with the collodion base, a matt surface being the result. Any spotting that is to be done, must be made with an albumen color, such as can be purchased in tubes, or a little white of an egg may be used when applying the color, which is preferably made by rubbing a solid cake color with a drop of water and albumen upon a piece of ground opal glass, watching the tint upon the side of the opal.

Stripping Films from Glass Negatives

The difficulties usually encountered in stripping a film from its support, and transferring it to a new plate of glass, are:

1. The separation of the film from its support without breaking or tearing.
2. Prevention of enlarging and distortion.
3. Manipulating the film while off the glass.
4. Laying it down on a new support without air-bubbles or wrinkles.
5. Securing its adhesion to the new glass.

In my own work it has been found to be a comparatively simple matter to overcome all these difficulties, though the operation is one requiring great care and delicacy in manipulation, especially when treating large negatives. Care is particularly required to avoid breaking or tearing a film which is being removed from a cracked or broken negative, but it is not a really difficult task. Frequently wood alcohol has been recommended by photographic writers for reducing a film to its original dimensions when it has expanded during stripping. In my experience, this is in every respect undesirable. Although a film may be reduced to its original size by the use of spirit, the enlarging and subsequent reduction are invariably accompanied by distortion. The film contracts unevenly, and the consequent alteration of form is absolutely prohibitive in many subjects, and undesirable in all.

Before commencing the operation of stripping, the film must be very thoroughly hardened, and the successful accomplishment of the work will depend very largely on the thoroughness of the hardening process. The solution should consist of two parts of commercial formalin to three parts of water; the negative should be immersed for about five minutes, and then washed in several changes of water for fifteen or twenty minutes, and then dried.

This formalin solution is very strong, but it possesses the power of rendering the gelatin film very hard. In using a weaker solution, there is a serious risk of slight enlargement and distortion of the film during the operation of transferring to the new support. By adopting the strength given, it will be found practicable to handle the film with reasonable freedom, and transfer it to the new support without injury or distortion.

The negative must be thoroughly dried before the operation of stripping is commenced. When dry, the film should be cut right through to the glass, about an eighth of an inch from the edge in the case of a large negative, or a sixteenth part of an inch for a small plate. A very sharp knife and a straight-edge must be used. All four edges of the negative must be cut in the same manner. The object of this cutting is two-fold: The first is the securing of a clean, sharp edge to the film when lifting from the glass, so as to obtain immunity from breaking or tearing. The edges of a negative plate hold the film very tenaciously, and there is great difficulty in lifting the film successfully from the original edges; the risk of breaking or tearing is very great. The risk is increased by the fact that the edges of the film are frequently comparatively ragged. By means of the clean, straight edge given by cutting through the film, the risk of tearing is practically removed. The second object of the cutting is to ensure that the film is slightly smaller than the glass to which it is to be transferred, as this greatly facilitates laying it down successfully.

At any time after cutting, the film is ready for stripping and transferring. The dry negative is immersed in a strong solution of washing soda. The solution is prepared by dissolving one ounce of washing soda in five ounces of water. Hot water should be used for preparing the solution, but it must not be used until quite cold. Sufficient solution must be used to cover the plate well, and care must be taken that no air-bubbles are allowed to remain on the surface of the film. The plate must remain in this solution for fifteen minutes, or a little longer. It should then be lifted out, and placed in a second dish containing a solution of hydrochloric acid, half an ounce of the acid to ten ounces of water. It must be taken direct from the soda solution to the acid bath without any intermediate washing. As soon as the plate is placed in the acid bath, innumerable air-bubbles will be seen to form between the film and the glass; it should not be touched while these air-bells continue to form.

After about five minutes, the operation of stripping may be commenced. First, the narrow edging outside the cut should be carefully lifted from the glass, removed from the solution, and thrown away. If any small pieces are allowed to remain in the solution, they may become a source of trouble by clinging to the film during transferring. As soon as these edges are entirely removed, the film itself may be slowly and carefully lifted from the glass. The best method is to apply the tips of the fingers to one end of the film, and roll it slowly off the glass. When about a quarter of an inch has been rolled back on to the film, the fingers should be moved back on to the glass from which the film has been removed, and the rolling movement continued, keeping the fingers in contact with the glass and the turned-up portion of the film. The fingers are always resting on the glass, and pressing against a roll of film that is being pushed along on the glass plate as it loosens its hold. The film will not curl into a roll by this method of working, but will simply fold back onto itself. The whole of this operation must be carried out while the plate is well covered by the acid solution.

The rolling back of the film must be continued until about half of the film is loosened, and turned back onto the other half. The loose portion should be then replaced in its original position, and the work recommenced from the opposite end, and continued until the film is entirely loosened from its support. The second half must then be returned to its original position, and the film will be lying flat on the glass, but quite free.

A piece of thin paper, slightly smaller in each direction than the film, must be put in the acid solution over the film, and allowed to soak for a few seconds, until it becomes quite limp. While this is soaking, the new glass support must be prepared for receiving the film. A solution of gelatin should have been previously prepared by dissolving a quarter of an ounce of gelatin in five or six ounces of water. The gelatin must be first soaked in cold water for about an hour, and then dissolved by draining off the cold water, and adding the requisite quantity of very hot water. Immediately before using, one grain of chrome alum dissolved in two ounces of hot water should be added to the gelatin solution, a little at a time, with constant stirring. This will make the total bulk of solution about seven or eight ounces.

The paper lying on the film should be carefully pressed into contact, care being taken to avoid wrinkles or folds, both in the film and in the paper. The glass plate should then be flooded with the hot gelatin, the paper and film lifted together from the acid bath, and adjusted in position on the gelatinized glass, and lightly but firmly squeegeed into contact. The strokes of the squeegee must be as even as possible, and always made from the center of the film toward the edges and corners.

The plate bearing the film and paper should be put aside for about ten minutes and then the paper may be carefully peeled off without any risk of disturbing the film. If the squeegeeing has been sufficiently careful, there should be no air-bells between the film and the glass. The film should lie perfectly flat and even, and in good contact throughout. It should then be put away to dry.

It will be noticed that the film is taken direct from the acid solution, and transferred to the new support without washing. It is imperative that the film should not be put in water, or expansion and distortion are inevitable. By following the method given, the film may be attached to its new support perfectly and without the slightest distortion or injury.

After drying, the film may be washed, to free it from the acid, but this operation must be performed very rapidly. It must not be prolonged more than eight to ten minutes, but by using seven or eight changes of water, the acid may be removed sufficiently for all practical purposes. After drying, the film should be varnished in the usual manner.

This method is thoroughly practical and reliable. It requires neither special skill nor the handling of dangerous chemicals or substances difficult to obtain. For hardening the gelatin solution, if chrome alum is not available, five grains of ordinary alum may be substituted.

As described, the procedure is that to be followed for transferring a film from a cracked or broken glass to a new support. It is self-evident that, by a very slight modification, it forms a very simple means of reversing negatives for carbon printing by single transfer when reversal of the subject is not permissible. The modification must be made when the film is lying in the acid solution. In the case of a small film, it may be turned completely over in the acid solution when stripped from the glass before the paper is applied. Then, by applying the paper and transferring to the new glass, as already described, it will form a reversed negative. In the case of a large plate, 8½ by 6½, or larger, the following method may be adopted if the former is found too difficult. Press the paper into contact with the film while it is lying in the solution, without attempting to turn it over. Then lift the paper, with the film clinging to it, and turn it over in the dish, the film being now uppermost. Then apply a second piece of paper to the film in the same manner as the first, and separate the top paper and the film carefully from the paper first attached to the film. Then the hot gelatin should be applied to the glass plate, and the transferring continued, as usual. The latter is the plan that I have always adopted for sizes above half plate.

Waterproofing Dishes of Wood

I NEEDED a few large size dishes for enlargements some time ago, and, being located in the country, decided that it would be better to attempt making my own.

I had seen various methods of making dishes, using wood, cardboard, white lead, paraffin, etc., but the making of these evidently needed more manual dexterity than I possessed, for none of mine were waterproof.

Some of those made of cardboard and very light wood bulge horribly when one uses a generous amount of developer, etc., in them.

However, I have made a really satisfactory dish at last, and the secret of its success lies in the waterproofing solution.

The methods I used were: First procure the lids of two butter boxes—the sizes vary slightly in the different factories, but choose pieces without splits.

These will serve for the bottoms of two dishes; in my case they measured 13½ x 12 in.

For each of these you will need the following pieces, which can easily be sawn from parts of the butter box; the wood is half-an-inch in thickness. Two pieces 13½ x 2 x ½ in., two pieces 11 x 2 x ½ in.

Securely nail the two longer pieces onto the piece which is to form the bottom; next fit the shorter pieces in position, and nail securely both at the ends and to the bottom. The nails from the old box are most suitable, and no difficulty should be experienced in driving, as the wood does not show any tendency to split. Put the dish aside in a warm place, and allow the wood to dry.

Now prepare the waterproofing solution as follows:

Procure a large, old, iron saucepan, and melt 3 pounds resin in it over a small fire. Watch and stir this carefully, or it may boil over or catch fire. When the resin is thoroughly melted, stir in 8 ounces powdered plaster of Paris, and when this is incorporated add the same amount of red ochre.

Stir well, and, when thoroughly mixed, add about 8 ounces linseed oil. Boil and stir the mixture till the tendency to boil over ceases; it is then ready to apply.

It is a good plan to keep the mixture on the fire, and to coat the dish over the saucepan and subject to as much heat as convenient. Use a good, wide brush, and paint the inside, taking care to work the mixture quickly and thoroughly into the crevices. When this is completed, paint the joints on the outside—it is quite unnecessary to paint the whole of the outside.

Leave for about fifteen minutes, and test to see if it holds water If not, apply more of the mixture where necessary. Pour out the water as soon as possible, and leave the dish a day or two to harden thoroughly.

The quantity given is sufficient for about five dishes, and is, of course, applicable to the smaller sizes.

For instance, a cigar box of suitable size, from which the alleged decorative paper is removed, when coated, makes quite a good developing dish.

These dishes will withstand practically all the chemicals a photographer is likely to use, and are very serviceable.—*The Australasian Photo-Review.*

How to Mix a Developer

No doubt most photographers would think it quite unnecessary for them to be told how to mix a developer, but there are really very few who know the right way to go to work.

In the first place, ordinary tap water should never be used; it nearly always contains lime and other salts, which are precipitated by the chemicals and they are apt to cling to the surface of the plate and may give rise to spots or markings, quite small it is true, but still there. A great deal of the lime and magnesia salts are held in solution by the air and carbonic acid, always present in tap water. Some people are, of course, more fortunate than others; my water is so full of air that negatives and films are completely covered with a layer of small air-bubbles when washing. It is advisable always to boil well the water used for the stock solutions, unless one uses distilled water. It should be boiled for at least ten minutes and allowed to cool down to about 100° F. and then filtered. A stock of this boiled water can be kept on hand in one of the stoneware water crocks with a wooden tap at the bottom and can be used for diluting the developer as well as mixing it.

In order to explain how to mix a developer we must take some simple formula, such as the *British Journal* formula for pyro, which is the best I have met with. It gives negatives practically free from stain and keeps well. It is:

A

Neutral sulphite solution	700 c.c.	10 fl. oz.
Pyro	18 gm.	126 gr.
Water to	1000 c.c.	16 fl. oz.

B

Sodium carbonate	100 gm.	700 gr.
Water	1000 c.c.	16 fl. oz.

For use mix 1 part of A, 1 part of B, and 2 parts of water.

The neutral sulphite solution is made as follows:

Sodium sulphite	70 gm.	1 oz.
Potassium metabisulphite	17.5	¼ oz.
Water	700 c.c.	10 oz.

Dissolve and boil for five minutes.

Everyone has some little peculiarities, and the following is one of mine: Nearly all my solutions are kept in two-quart jam bottles with wide mouths, rubber rings, and a metal spring that holds the lids down tight. These cost but a few cents; as a matter of fact, a nearby soda fountain will give me all I want for nothing, as they are glad to get rid of them. Every bottle, no matter what its size, has a definite quantity of water poured into it and the level marked with a diamond and the quantity of water also marked. This saves no end of time, as one has merely to pick up a bottle and read off at once what it will hold. Further than that, any bottle can be used as a graduate.

To mix the above developer a bottle is found and the dry salts put into it and then filled up with water to the 1400 c.c. mark. It being necessary to boil the solution, an iron kettle is found that will hold plenty of water; a couple of old plate-box lids are placed on the bottom, the bottle put in, and then cold water run in till it reaches nearly to the top, care being taken by lifting the bottle once or twice that the box lids are well saturated with water. Then the gas is turned on and the water allowed to heat gently, and at the same time the contents of the bottle heat up. If the outer water is hot, and the cold bottle is put into it, one stands a very good chance of cracking the bottle and losing the solution. The box lids or a pad of thick paper are all-important, as they prevent the direct heat of the gas from striking the bottle and thus prevent it cracking. When the solution has boiled, allow to cool down to about 100° F. (a dark-room without a good thermometer is only half equipped), then filter and add the pyro and make the total bulk up to 2000 c.c. *Do not filter after adding the pyro*, as you simply expose it to the action of the air and it becomes partly oxidized and the negatives are stained.

Exactly the same method should be applied to the making of all developers. One should bear in mind that the trick to obtain clean, white stock solutions that will keep is to dissolve the preservative first, that is the sulphite, then filter, and then add the developing agent. In all cases the quantity of the latter is so small relatively that the best way is to make the sulphite solution up to the full quantity and then add the developing agent, cork and shake well.

The only exception to this procedure is in the case of metol, elon, and rhodol; this must be dissolved first and completely dissolved before the sulphite is added. This is important and as much water as possible should be used, otherwise the metol is thrown out of solution and it is not easy to dissolve it again. If one has to make up a metol-hydroquinone developer, and but little water be used, a very insoluble precipitate, metoquinone in fact, is thrown down, and then nothing but actually boiling the solution will form a clear solution.

When one has to deal with a one-solution developer, in which the alkali and the reducing agent are combined, the latter and the preservative should be dissolved in about half the water, the graduate well washed, and then the alkali dissolved in the remainder of the water and added to the other and immediately corked up. Traces of the developing agent in the graduate immediately oxidize in the presence of an alkali and a white solution cannot be obtained.

I have seen many an assistant try to dissolve sulphite or carbonate or both by adding them to water and then stirring. This is wrong. In nine cases out of ten both will settle into a solid lump at the bottom, which is extremely difficult to get into solution. The proper way is to stir the water well with a rapid circular motion and sift the dry salts in slowly, very slowly. Then every particle of salt becomes surrounded with water and cannot form a cake. In all cases the temperature of the water should be at least 85° F.

There are two ways of making the alkaline solution for two-solution developers: The one is to use ordinary tap water, dissolve your salts and boil and cool and then filter. This removes most of the lime and magnesia salts; but it leaves your solution loaded with chlorides, which are restrainers. The correct way is to use distilled water or, as has already been pointed out, boiled water. Undoubtedly distilled water is the best and there are many cheap and economcially-working gas stills on the market that it will almost pay to install.

As to the keeping of stock solutions of developers, many plans have been suggested, such as aspirator bottles, covering the surface of the solutions with films of oil, which is about the nastiest and dirtiest plan that I have ever tried. No one can say which is the best method, for the simple reason that no one but the user knows exactly how long a pint or gallon of developer will last, and the plan for one dark-room will be absurd for another. Personally, I always make up my solutions in 2000 c.c. lots, and they last me about three days, so that I never have to bother with the question. If I had to, I should make up the same quantities in bulk and then bottle off into smaller bottles, say of 500 c.c. capacity, so that constant opening of the bottles would not introduce so much air, which is the cause of stock solutions turning dark.

A photographer using a gallon of developer a week can afford to make up only that quantity, and can always spare the short time required to make up a fresh batch, after hours, at the end of the week, for with a little system and the right way of working it becomes a most simple matter to always have on tap the right developer made right.

A Method For Determining the Photographic Absorption of Lenses[1] (Abstract)

THE axial photographic transmission coefficient of a lens system for a given set of conditions will here be defined as the ratio of the light flux of photographic quality in the image of a small object on the axis of the system to the light flux of photographic quality that would reach the image were there no losses of any kind in transmission through the system, other conditions remaining the same.

The method employed in determining this coefficient involves the photographing of the lens image of a controlled circular source of approximate daylight quality and radiating according to the Lambert cosine law. Immediately after the completion of the lens exposure strips of the plate on both sides and adjacent to the lens image are impressed in a series of steps by direct action of the same controlled source in such a manner that the exposure in each step is continuous from beginning to end. From the developed plate the ratio of the times of exposure for equal densities in strips and image may be found. This ratio, together with the dimensions of the apparatus and the lens, gives sufficient data for the determination of the transmission coefficient of the lens for light of photographic quality. If dependable results are to be obtained care must be exercised in screening the plate from the action of stray light, from nearby objects during the sensitometer exposure and from barrel reflections during the lens exposure. These later may easily be eliminated by using a stop considerably less than the maximum, thereby eliminating the reflected light from cell rings and lens edges.

The entire light flux directed toward the entrance pupil of a lens system from a small element of source dS_0 on, and perpendicular to the axis of the system and radiating according to the Lambert cosine law is

$$L = \pi I_o dS_o \sin{}^2 U$$

in which I_o is a constant characteristic of the source and U is the angle subtended at the source by the radius of the entrance pupil. Were there no losses this flux would ultimately be uniformly distributed in the image whose size is controlled by the magnification. The flux density in the image (angle of incidence on plate disregarded) would therefore be

$$I_i = \frac{\pi I_o \sin{}^2 U}{Y^2}$$

in which Y is the lateral magnification assumed positive for real images.

Now if a photographic plate be directly exposed to the action of radiation from a plane circular source parallel to the plate and radiating according to the Lambert cosine law the flux density at the plate will be

$$I_s = \frac{\pi I_o R^2}{R^2 + l^2}$$

in which I_o is the constant characteristic of the source and R its radius, and l is the perpendicular distance from the source to the plate.

From these fundamental equations the expression for the transmission coefficient may easily be found to be

$$T = \frac{t_s}{t_i} \cdot \frac{R^2 Y^2}{(R^2 + l^2) \sin{}^2 U} = \frac{t_s}{t_i} \cdot \frac{R^2}{R^2 + l^2} \left[Y^2 + \frac{[Y(f+d)+f]^2}{h^2} \right]$$

in which t_s–t_i is the ratio of exposure times for equal densities in strips and image, d is the distance from the first principal point of the lens system to the entrance pupil considered positive when the entrance pupil is farther away from the source than is the first principal point, and h is the radius of the pupil. The equivalent focal length of the system is represented by f and the other symbols have the meanings already stated. When the object distance is large Y is small and may become negligible in comparison with f, in which case the equation reduces to the following simple form.

$$T = \frac{t_s}{t_i} \cdot \frac{4R^2 S^2}{R^2 + l^2}$$

in which S is the F-number of the lens.

Because of inherent irregularities in the photographic plate, quite a number of exposures must be made in order to arrive at a good average value of the transmission coefficient. The preliminary results obtained have been found to be in good general agreement with those found by visual methods[1] as well as with values deduced from the theory of reflection and absorption. —G. W. MOFFITT.

---

[1] Communication No. 87 from the Research Laboratory of the Eastman Kodak Company. Read at the St. Louis Meeting of the American Physical Society, December, 1919, and published in *J. Opt. Soc.*, May, 1920, p. 83.

[1] P. G. Nutting, *Astrophys. Jour.*, **40**, pp. 33–42, 1914; R. W. Cheshire, *Pros. Opt. Con.*, pp. 34–40, 1912.

The Importance of the Nodal Points in Lens Testing [1]

THIS paper deals with the interpretation of the lens bench measurements when no collimator is used and when the object distance is limited.

In such cases the lens does not pivot on the second nodal point when lateral shift of the image is eliminated for small rotations of the nodal slide, but on a point which divides the separation of the nodal points into parts proportional to the magnification.

The complete formula for calculating the true focal length is derived, and the conditions under which the ordinary approximate reduction is sufficiently accurate are discussed. An important conclusion is that the true equivalent focal length of any lens cannot be determined with certainty unless the apparent separation of the nodal points for the object distance actually used be determined.

For the correct reduction of field readings under the conditions of the test, additional formulæ are derived. Strictly speaking, one cannot deduce from such a set of readings what the field aberrations would be for a plane object at any distance from the lens. With respect to photographic distortion, there is no reduction that rigidly satisfies the problem in general, but an approximation sufficiently good for all practical purposes is obtainable in nearly all cases.

These refinements need not be taken into account in many cases, but it is always necessary to determine actually whether or not they may be ignored.—G. W. MOFFITT.

A Tilting Tripod Top

THE advantages of the tilting top for the tripod are so well known that it is unnecessary to recapitulate them here; suffice it to say that in natural history work, in photographing ultra tall buildings, and in copying, it is well-nigh indispensable.

Recognizing these facts, various manufacturers have placed efficient devices of the kind upon the market. But sometimes the photographer forgets to purchase a thing of this kind until he happens to need it—and then, as there is no time to secure it from the distant supply house, he has to get along with a makeshift.

The top illustrated is such a makeshift, in that it may be knocked together in ten minutes; on the other hand, if you do not insist upon nickel and mahogany trimmings adorning all of your equipment, you will find it as satisfactory as more expensive apparatus.

The main part of the top consists of two pieces of board, each one inch thick and a little larger than the round top already on your tripod, hinged together at one end; the illustration shows these hinges as being upon the surface, but in order that the boards may fold tightly together they should be let into the wood a trifle.

The next step is to secure a short bolt and nut having the same thread as the tripod screw; this should be within the province of any hardware store. The hinged halves should then be folded together and a hole just large enough to admit this bolt be bored through their centers; then, if the bolt is fixed into the hole in the upper board so that the threaded end projects up through, it will serve as the new tripod screws for attaching the camera. The nut, on the other hand, is fixed in the hole in the lower board, and, when engaged by the screw in the main tripod, holds the new top firmly in place.

To complete the tilting device it is only necessary to arrange some means of holding its parts at the angle desired. This may be done in a number of ways; the one illustrated consists of a slotted strip of brass with notches filed in the edge of the slot—the strip moves about the pin driven into the edge of the lower board as a center. To engage the notches, two or more pins may be driven into the edge of the upper board; the strip may be slipped from one pin to another when necessary by simply springing it outward.

Of course, if you are intending this top for temporary use only, the slotted brace may be omitted and the parts held in place by means of cords. For a permanent addition to your outfit, however, you will need the brace; it will also be an advantage to sandpaper the blocks smooth and give them several coats of good varnish—this will both add to their appearance and prevent them from warping.

Whether permanent or temporary, you will find the tilting top a handy thing to have about, and well worth either the price asked by the dealer or the slight labor by means of which it may be made.

Roll-film Development

THE advantages of "tank" development of roll-films are too obvious to comment upon, and we will therefore confine our remarks to the chemical side of development.

We must confess to a wholesome respect for the pyro-soda developer. It gives that "bite" or resistance to the negatives, thus making it an easy matter to get good prints from them. By reducing or increasing the amount of sodium sulphite, the color of the deposit can be altered—less sulphite giving the characteristic pyro deposit. For tank work it is not advisable to considerably reduce the sulphite owing to the rapid oxidation of the pyro that takes place. There are several formulæ to choose from, but we give below one that has proved satisfactory to us in our own work:

PYRO-SODA "TANK" DEVELOPER

No. 1

Pyrogallic acid	1 oz.
Sodium sulphite (cryst) . .	2 oz.
Citric acid	40 gr.
Water to	10 oz.

No. 2

Sodium sulphite (cryst) . .	8 oz.
Sodium carbonate (cryst) .	8 oz.
Water to	80 oz.

---

[1] Communication No. 89 from the Research Laboratory of the Eastman Kodak Company, published in *J. Opt. Soc. Amer.*, 1920.

To make a working developer that will fully develop a film in 25 minutes at 60° F. take:

No. 1	½ oz.
No. 2	4 oz.
Water to 40 oz.	

Adding 20 drops of a 10 per cent. solution of potass (bromide).

The temperature of the working developer must be correctly ascertained, as it has an important bearing upon the time of development. For instance, if at 60° F. a film takes 25 minutes to develop, it would only take about 16 minutes at 70° F. The addition of metol is often recommended, but we do not find any increase in the shadow detail by its use.

An extremely useful developer (for dish use) is metol-hydroquinone in which the alkali is caustic soda. This developer gives the greatest contrast and density it is possible to obtain. It is also very rapid and searching in action.

M. Q. DEVELOPER FOR FILMS

No. 1

Metol (or Monomet) . .	90 gr.
Sodium sulphite (cryst) . .	8 oz.
Hydroquinone	1 oz.
Potass (bromide) . . .	120 gr.
Water to	80 oz.

No. 2

Caustic soda (sticks) . .	2 oz.
Water	80 oz.

For use take equal parts of Nos. 1 and 2, mix, and add an equal bulk of water.—*Rajar Trade Notes.*

Developers for the Autochrome Plate

WHILE pyrogallic acid has been almost abandoned as the developer by workers of the Autochrome process, a number of other developing formulæ have come into use, and have been more or less commonly employed. It should be said at the outset that these are simply variations of those recommended by MM. Lumière.

The developer metoquinone was recommended by MM. Lumière on its introduction, and the first formula published by them was as follows:

Water	1,000 c.c.
Metoquinone . . .	4 gm.
Soda sulphite (anhydrous)	18 gm.
Ammonia, .923 . .	6 c.c.
Potass bromide . .	1 gm.

A short time afterward this formula was replaced by one of considerably greater concentration, which has not been subsequently modified.

Water	1,000 c.c.
Metoquinone . . .	15 gm.
Soda sulphite (anhydrous)	100 gm.
Ammonia, .923 . .	32 c.c.
Potass bromide . .	6 gm.

In making up this formula the metoquinone should be dissolved in warm water of the temperature of from 90° to 105° F. Cold water dissolves the developer very slowly; boiling water is apt to throw it down as a precipitate. The soda sulphite and bromide should be added after the metoquinone has been dissolved. On no account should any other chemical be added until the metoquinone has completely dissolved. The ammonia should not be added until the bath has been allowed to become quite cold.

In filtering the developer a large filter-paper and funnel should be used so that filtration takes place quickly. The funnel should be covered with a sheet of glass in order to prevent evaporation of ammonia. Although the bath keeps well in this concentrated form it is not a bad plan to store it in small bottles holding three or four ounces. These should preferably be closed with rubber stoppers.

A further formula which MM. Lumière introduced is one made up as above with the difference that the metoquinone is replaced by the same weight of chloranol, another developer of theirs. Chloranol has the advantage that it is about twice as soluble as metoquinone, so that the stock solution is much more readily prepared. Apart from this feature, chloranol has certain qualities which are an advantage in Autochrome work. One of these is that the silver image which it gives is of a somewhat brownish or warm black color, and thus tends to counteract a tendency to bluish tint in the Autochrome. It gives a somewhat greater degree of contrast, and, when it is used, intensification is less frequently necessary in order to obtain the required vigor in the transparency. The image comes up a little more slowly with this developer, and is also less rapid in reaching a sufficient degree of depth. It is therefore necessary to develop for a somewhat longer time with the advantage that the process is under better control. For these various reasons chloranol is a better developer than metoquinone except in cases of underexposure, when metoquinone is distinctly superior.

Another variation of the above formula consists in replacing the 15 gm. of metoquinone by

Methylparamidophenol .	10 gm.
Hydroquinone . . .	5 gm.

This developer gives practically the same results as that made up with metoquinone, although it is somewhat less energetic in its action. The plates are of soft gradation, very suitable for stereoscopic transparencies. In the case of subjects containing great contrasts of light and shade, such as those taken "against the light," it is easier to obtain harmonious results than when using metoquinone.

To those who seek to obtain Autochromes of the utmost brilliance and transparency for projection the following modification of the original metoquinone formula may be strongly recommended. The 15 gm. of metoquinone are replaced by:

Methylparamidophenol . .	7 gm.
Hydroquinone	8 gm.

This formula is also very suitable for plates which have been hypersensitized. The methylparamidophenol in these formulæ is that made by Lumière, but no doubt any reliable metol will answer as well. But it is necessary to caution the Autochrome worker against using any developer which may be sold as metol or its equivalent. During the last few years a number of products have come upon the market for which the vendors have claimed the properties of metol. The use of a substitute which is not identical with metol will only be a cause of disappointment in the use of these formulæ. Those who do Autochrome work only at comparatively infrequent intervals will be well advised to buy the developer ready made in solution as supplied by Lumière.—VICTOR CRÉMIER, in *B. J.*

Ammonia with Pyro-soda

A READER using an old pyro-soda developer found it very slow in action, and the negatives finally obtained were thin and lacking in detail. On adding some ammonia to the developer the results were much better. This led him to wonder if there were any advantage in always making such an addition. The obvious conclusion is that his soda solution had so deteriorated as to have become almost inert: though it is difficult to imagine how such a change had arisen, as the carbonate is the ingredient least likely to change. The carbonate was no longer properly performing its function as an accelerator and allowing the pyro to reduce the silver bromide to the metallic state. By adding ammonia he was simply providing another well-known accelerator, and one that was formerly very popular. If the carbonate of soda is no longer in good working order in the solution, the developer will not work properly. If it is the sulphite of soda that has lost its efficacy, it will no longer perform its duty of keeping the image and the gelatin clean and free from undue stain. The whole matter is an object lesson in the importance of having some knowledge of the purpose of each of the constituents of such a developer. Pyro, carbonate, sulphite, and (if present) potassium bromide, each has its separate function: and the failure of any one to do its particular share of the work will inevitably affect the results.

The Influence of Hypo in the Metol Developer

THE influence of hyposulphite of soda on the metol developer is a question worthy of research, and it gives me pleasure to make known my experiments in this direction.

It will no doubt seem strange that hyposulphite of soda should have a beneficial effect in any developing solution, the characteristics of this chemical rather foreshadowing a deleterious influence. This is, however, not so in practice, the presence of hyposulphite of soda in small quantities being of great advantage in metol-developing solutions.

My primary experiments consisted of a comparison of the following formulæ:

A

Water	1000 min.
Metol	15 gr.
Sulphite of soda . .	150 gr.

B

Water	1000 min.
Carbonate of soda .	330 gr.

Twenty parts of A to 10 parts of B and 30 parts of water were then mixed ready for use.

A pyrogallic acid developer of normal strength was then prepared as follows:

A

Water	1000 min.
Sulphite of soda . .	200 gr.
Pyro	28 gr.

B

Water	1000 min.
Carbonate of Soda .	100 gr.

Twenty parts of A, 20 parts of B, and 20 parts of water were then mixed ready for use.

These two solutions were placed in separate trays; a number of plates of one emulsion were now exposed under a Warnecke sensitometer, thus assuring equal exposure, and a plate was placed into each solution of developer at the same moment. The development was continued until the number of the sensitometer representing the speed of the plate was of like density on both plates.

Upon fixing the plates it was apparent that the negative developed with metol, although showing greater details, was not quite as brilliant as the pyro negative.

Further test was made with new solutions prepared by exactly the same formulæ, adding to the B solution of the metol development 1, 2, 5, and 10 parts of hyposulphite of soda. The developer which contained one part of hyposulphite of soda gave a result equal in brilliancy in every respect to the pyro developer, with fine contrast and an absolute clearness. The absolute freedom from fog in the metol solution thus prepared was remarkable, and in many respects the negative was to be preferred to the result obtained with pyrogallic acid.

The addition of hyposulphite of soda to the metol developer acts as a retarder to a certain degree, and certainly prevents a fog. *Greater detail is obtained* than without its use, although if the hypo is increased in quantity the effect is exactly reversed.

Satisfied that this subject was worthy of further research, I experimented for some time with the following:

METOL-HYPO DEVELOPER

A

Water	1000 min.
Metol	15 gr.
Sulphite of soda	150 gr.

B

Water	1000 min.
Carbonate of Soda .	330 gr.
Hyposulphite of soda .	1 gr.

For studio work I found best suited 40 parts of A; 20 parts of B; 20 parts of water. For landscapes, 20 parts of A; 10 parts of B; 30 parts of water.

In my experiments I invariably tested this developer against a normal pyrogallic-acid developer and found that metol-hypo developer prepared after the above formula gave most excellent results for both portraits and landscapes, and that the results were fully equal if not superior to pyro developer.—J. M. E.

A Copying Hint—How to Avoid Grain

Having occasion quite recently to copy a couple of bromide prints on a paper having a medium grained surface, I was considerably troubled by the grain of the paper.

To those who have not done much copying, I may explain that a print on rough-surfaced paper, when copied with ordinary lighting, gives a more or less mottled appearance owning to each tiny little hillock of the rough surface casting a shadow. The side toward the light, on the other hand, receives more than the normal lighting, so that we get a series of tiny little light patches with little patches of shadow alongside, thus producing a more or less mottled appearance mentioned above.

The usual way of avoiding this is to illuminate the print equally from as many different directions as possible. In practice, two are usually sufficient: say at about 45 degrees from the left-hand side and about 45 degrees from the right-hand side. In this way the shadow side of each hillock, from one direction of the lighting, is the illuminated side of the other, and if the lights are of approximately equal intensity the mottled appearance is very considerably reduced.

The appearance of grain is not entirely removed, because the summit of each little roughness is illuminated by both lights and is therefore a little brighter than the hollows.

As enlargements had to be made from the copy negatives, it was desirable that the grain and the effects of the surface sheen should be eliminated as much as possible, and as ordinary copying methods failed to do this sufficiently, some fresh scheme had to be devised. (I might mention here that two process engravers had failed to make satisfactory blocks of the prints in question, so that they were fairly difficult subjects.)

After several attempts the following method was found to be entirely successful:

The only additional material required is a sheet of good quality glass, free from flaws and a little larger than the prints to be copied, some glycerin, and a large sheet of black paper or a dark cloth—even brown paper will do.

A pool of glycerin, as free from air-bubbles as possible, is placed in the middle of the glass, which is lying flat on a newspaper spread on the table. The print is then bent in a curve, film outward and the middle brought in contact with the pool of glycerin. Then the curve is gradually straightened out and the glycerin will be driven slowly out in a thin film, so that the print is now connected to the glass by a film of glycerin without any air-bubbles. If any air is imprisoned it may be possible to squeegee it out. If not, lift the print and try again, as any tiny air-bubbles will show distinctly in the copy negative. If the print is on very rough paper it will be found easier to get rid of air-bubbles if the surface of the print is first coated with glycerin so that the hollows are completely filled with it, as it is there that the air tends to stick.

It will now be found that the print is very much brighter in appearance, looking like a *wet* print instead of a *dry* one—and the grain has practically disappeared. The reason for this is that glycerin has a refractive index very nearly the same as that of ordinary plate glass. (As an instance of this, a glass rod in a bottle full of glycerin is almost invisible.) Since the glycerin fills up all the hollows of the paper, and is in contact with the entire film of the print and also with the surface of the glass, this is practically equivalent to mounting the print in optical continuity with glass, *i. e.*, we have to all intents and purposes substituted the surface of the glass for that of the print.

All that now remains is to copy the print in such a way as to avoid surface reflections from the glass. The method I adopted was this:

The glass with print glycerined onto it was placed on a board and fastened to it with glass-headed dark-room pins. The board was then fastened on a wall and the camera set up in front of it, taking care to ensure parallelism. As the lens is opposite the center of the glass, it follows, from the laws of reflection, that the only objects reflected from the glass into it, will be objects straight in front of the glass, *e. g.*, bright parts of the camera—the white shirt of the operator, etc. To avoid this, take a sheet of brown paper, say, at least four times the size of the sheet of glass, and make a hole in the center through which the lens projects and hold it in position while exposing. Now, the only possible object which can be reflected from the glass into the lens is the feebly actinic brown paper, and what reflection there is will be uniform all over. Theoretically, black paper or cloth would be better, but I have found the brown paper quite effective and more easily obtained.

Diffused daylight is perhaps the best light to use, and the exposure should be a generous one, say double the calculated exposure.

When a good copy negative has been secured the print is removed from the glass, rinsed under the tap and dried. Glycerin mixes with water in all proportions so is very readily removed, and the print remains as good as ever.—*Australasian Photo Review.*

Cleaning Hand Stains

You have noticed, no doubt, that some photographers keep their hands as clean as a debutante's, while others have stained fingers and nails which remind you of the days when, as boys, we used to gather black walnuts and muss up our fingers with the stain it took weeks to wear off. But the walnut stain could be removed with the juice of a half-ripe tomato, "squashed" in the hands and well rubbed in.

One of the reasons for pyro stains, strange as it may seem, is cleanliness. The man who is forever washing and drying his hands while he is developing is going to get them stained. The washing is well enough, but it is the drying that's bad. Dry hands stain, while wet ones don't, to any appreciable extent.

Some even claim that staining can be entirely done away with if dry fingers are never dipped into the developer—if the hands are kept wet and rinsed before and after placing them in the developer and after having them in the hypo.

It seems easy enough to keep the hands wet, but it isn't, for there is always that desire to dry them.

I remember an old boss of mine who was quite a social light in our small town and he never had stained fingers. He kept an old mortar in the sink alongside the developing tray in which he kept a weak acid solution. About 1 ounce of hydrochloric acid to 50 ounces of water will do though I don't believe he ever measured it. He rinsed his hands in this before and after having them in the developer and kept them free from stains.

But most people prefer to use ordinary precautions, such as rinsing the hands frequently, and then to remove any stains afterward, which is very simple if you have no cuts on your fingers. The stain remover is the permanganate and bisulphite formula which has often been recommended but which you may have forgotten.

There are two solutions: No. 1 consists of about one-half ounce permanganate of potash to 50 ounces of water, and No. 2, 5 ounces of bisulphite of soda to 10 ounces of water, or a larger quantity in the same proportions.

To remove stains from the hands it is necessary to thoroughly rub and scrub the hands, nails and under the nails with the No. 1 solution, which is a poison, so cuts must be avoided. When the hands have been thoroughly stained with the permanganate they must be just as thoroughly scrubbed with the No. 2 solution, which takes away both the permanganate and pyro stains and leaves the hands clean.—*Photo-Digest.*

Photographic Materials and Processes

Photographic sensitometer; New non-intermittent ——. L. A. Jones. Phot. J., 1920, 60, 80—98.

Two instruments of the continuous exposure-variable time type are described. In the second instrument, which is better adapted for routine work, a shutter, actuated by a solenoid and ratchet, moves quickly but discontinuously across the sensitive surface at definite time intervals. In the timing mechanism, which controls the solenoid, a cinema film, moved at a uniform speed by a governed electric motor, is provided with a series of collinear apertures spaced from one another at distances corresponding with the exposure ratios required; the distances are measured in terms of the edge perforations to allow for normal variations in the length of the cinema film. One arm of a lever rests on the film in line with the operating apertures, into which successively it drops as the film moves; the lever carries an electric contact point so that the current operating the solenoid is completed when the lever drops. Other perforations, etc., are arranged so that the depression of a contact switch starts the whole apparatus, which continues in operation until the exposure is finished and is then automatically cut off. A number of exposure machines may be connected at a central station with corresponding timing mechanisms operated by the same motor. Tables are given showing the timing mechanism to be satisfactory when tested against a chronograph and showing the speed and gamma obtained for a photographic plate to be independent of the absolute exposure, not variable with it as is the case with intermittent exposure machines.

Dye impression photographic printing process. F. W. Donisthorpe. Phot. J., 1920, 60, 119.

A NEGATIVE, on paper, glass, or other suitable support, is treated in a special preparing bath for about 10 min., rinsed, and then treated with a dye solution for 3—10 min., according to the exposure and development of the negative, a longer immersion being required for overdevelopment or overexposure. After rinsing the dyed negative it is ready for the production of positives, in the color of the dye used, by pressing on to it damp gelatin-coated or baryta-coated paper, contact for about 1 min. being requisite. After taking off, the print merely requires quick drying.

Colloidal silver; Formation of —— in photographic developers and means of avoiding it. L. Lobel. Bull. Soc. Franç. Phot., 1920, 7, 21—22.

In using developing solutions containing sodium sulphite small quantities of silver bromide pass into solution. This occurs, in general, more easily with papers than with plates, since the bromide is in a finer state of division, and more easily with developers having a low content of alkali carbonate in proportion to the sulphite. The dissolved silver salt is reduced by the developer, and part of the reduced silver is deposited on the dishes, etc., and part remains in colloidal solution. Continued use of the developer tends to the production of dichroic fog by deposition of the colloidal silver in the body of the film, and solutions still having considerable developing power may be rendered useless on this account. Ordinary filtering methods will not hold back the colloidal silver. If, however, about 20 per cent. of sodium sulphate is added the colloidal silver is coagulated and deposited; its formation is also prevented by the addition of the same salt to a new developer.

Colored [photographic] sensitizers derived from quinolines, quinaldines, and lepidines containing dimethylamino and diethylamino groups. H. Barbier. Bull Soc. Chim., 1920, 27, 427—439.

THE author has prepared the methiodides and ethiodides of *p*-dimethylaminoquinoline, of 6-diethylaminoquinoline, of 6-dimethylamino quinaldine, and of 6-dimethylaminolepidine, and finds that when these alkyl iodides containing a dialkylamino group are condensed among themselves or with alkyl iodides of other bases or with *p*-dimethylaminobenzaldehyde, they give a series of new coloring matters belonging to the cyanines. All of these cyanines, which contain the active auxochrome group, $N(CH_3)_2$ or $N(C_2H_5)_2$, can be used as photographic sensitizers. (*Cf.* J. C. S., Aug.)

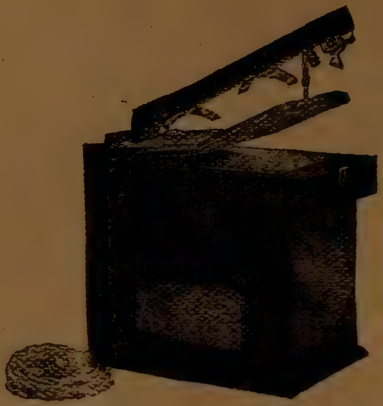
l.57. No. 11 November 1920 20 Cents

The Photographic Journal

of America

NOV 12 1920

Published Monthly
With Illustrations



ANSCO
5 x 7
PRINTING
MACHINE

Price: $10

This Ansco Printer takes the bother out of printing. The amateur photographer who uses it gets more uniform results, more conveniently, and in shorter time. It makes printing sure and simple in any kind of room that has electric current. It is especially well adapted to the requirements of the commercial photo-finisher.

DETAILS: Takes negatives up to 5 x 7; has ruby glow and uses a standard 40-watt Mazda lamp as the printing light; lower window provides orange light for developing prints, and ruby safe light for developing plates and films.

Built with the same care for essential *rightness* that has made Ansco cameras famous.

Ansco Company
Binghamton N. Y.

THE PHOTOGRAPHIC JOURNAL *of* AMERICA

REGISTERED IN THE UNITED STATES PATENT OFFICE

NEW SERIES: WILSON'S PHOTOGRAPHIC MAGAZINE

AN ILLUSTRATED MONTHLY DEVOTED TO THE SCIENCE AND ART OF PHOTOGRAPHY

THE OLDEST PHOTOGRAPHIC MAGAZINE IN AMERICA
Founded 1864

Incorporating:
The Philadelphia Photographer The Photographic World

THOMAS COKE WATKINS, Editor

CONTENTS FOR NOVEMBER, 1920

Placing the Head in the Portrait . . . . Sigismund Blumann 417
Booklets for Advertising 419
Running a High-class Studio . . . . L. Haweis 422
Editor's Table—Improving your Work—Criticism 425
The Studio—Practical Papers on Studio Work and Methods 429
Views and Reviews 434
The Workroom 437

YEARLY SUBSCRIPTION, in advance, postage paid, United States, Mexico, Cuba, Philippines and Porto Rico, $2.00; Canada, $2.35. Countries in the Postal Union, $2.75. Single copies, 20 cents.

REMITTANCES may be made at our risk by money order, check, draft, or registered letter.

SUBSCRIPTIONS begin with current issue.

Published by EDWARD L. WILSON COMPANY, INC.,
THOS. C. WATKINS, President. **701 Arch Street, Philadelphia, Pa.**
EXECUTIVE and EDITORIAL OFFICES, CAMERA BUILDING, 122 EAST 25th ST., NEW YORK CITY
HOUGHTON'S, Ltd., London, Eng., Agents for Great Britain
American News Co., Distributors for U. S. Kodak Australasia Ltd., Sydney, Agents for Australia
RICHARD HILL, Devonport, Auckland, Agent for New Zealand

Entered at Philadelphia Post-office as Second-class Matter

This is one of a series of sketches on Leading American Photographers.

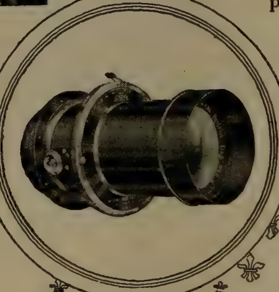
American Photographers

J. E. MOCK—Rochester's own contribution to the halls of fame, Mr. J. E. Mock of the camera city, hardly needs an introduction, for his contributions to the photographic art have brought him not only national but international recognition.

Mr. Mock objected somewhat to having the spotlight of publicity turned on his commendable work but through the good graces of his receptionist, we had the pleasure of looking over his personal scrap-book. The trophies and honors from all parts of the globe mentioned therein in newspaper clippings, were actually too numerous to itemize.

A pioneer in new ideas, Mr. Mock has frequently blazed the trail to better workmanship. He has also often served photography on the convention platform, and as an officer in photographic associations.

Success depends mostly on the man behind the gun. Yet, we think that our Vitax and Verito have helped Mock as they have helped thousands of others.



This is the Vitax F:3.8 which Mr. Mock uses extensively in conjunction with his Verito. He finds this lens offers many advantages because of its extreme speed. It is ideal for winter work, when the light is poor, or for making pictures of babies.

WOLLENSAK OPTICAL CO.

ROCHESTER, NEW YORK.

Sensation in the Photographic Line

The Brieloff Universal Studio Lamp in your studio assures you of even light at all hours of the day or night. You do not have to depend on the uncertain daylight, nor disappoint your customers. The least touch will adjust any reflector in any way for portraiture or in group. A single spotlight will help even with daylight for special lighting. All adjustments automatic. Price - - - - - **$20.00** and up

The Prosch Home Portrait Bag is very practical for individual, small groups or banquet work; can be operated in series, and it will pay you to have a set, for you can never tell when you may be called on a job. Complete outfit, ready for use - - - - **$22.50**

Send for a full description on
Prosch Smokeless Flash Bags
Sunlite Flash Powder
Blow Lamps
Brieloff Studio Lamp
and the latest improvement, the
Hand Flash Lamp

Prosch Mfg. Co.
DEPT. W
61 Fulton St. New York

HEYDE'S ACTINO PHOTO-METER

Eliminates Guessing in Photography!!

The simplest, most effective and most accurate instrument for determining correct time for exposure.
Easily and quickly manipulated; compact and always ready for use.

No Sensitive Paper Used For Tinting

Exposure table complete on dial.
Essential to the Photographer who wants perfect pictures.
Order by mail or from your dealer.
Write for descriptive booklet.

New Vest Pocket Model
Size Dia. 2-3/8" x 13/16" Thick
Price $10.

Dealers: A postal will bring our special offer.

HERBERT & HUESGEN CO.
18 East 42nd. Street
NEAR 5TH AVE., NEW YORK.

STUDY
BY IMOGEN PARTRIDGE
SEATTLE, WASH.

The
PHOTOGRAPHIC
JOURNAL
of AMERICA

VOLUME LVII NOVEMBER, 1920 NUMBER 11

THE AUTHORITY FOR THE PROFESSIONAL PHOTOGRAPHER
PJ A
FOUNDED 1864

Smithsonian Institution
NOV 12 1920
National Museum

PLACING THE HEAD IN THE PORTRAIT

By SIGISMUND BLUMANN

THERE is an astonishing difference in opinion and taste, certainly in practice, as to how near the top of a portrait the head shall be placed. Passing the original souls who are happiest when half the tophead is cut off or the head and back hair are lost in the margin of the picture, we must take the conservative standards to reach any general conclusion.

It is not safe to resort to the great painters to help in a decision ,for color, odd to say, and the brush technic have modifying influences. But by studying the best portrait photographers, and (let us not belittle financial success) those who have established themselves with large clienteles, we may arrive at more or less certain deductions. At least we may accept that the methods of those who succeed are methods that we can safely follow in striving for success.

Art is purely temperamental; but all temperament is not art. Every whim and freak that has no distinction so marked as the one of differing from everything hitherto done, is not thereby constituted as artistic. In fact, too labored a chase after originality has often killed genuine talent. So we shall dare to say that a portrait in which the head is at one of the lower corners, or chopped off by the top, or nearly bumping its skull against the upper margin, is not by its unique appearance even to that extent artistic. In fact, so many amateurs who have just entered the competitive field of making a living by what they erstwhile did, and were paid for in praise, are doing these things that they are not even original.

There are reasons conceivable when eccentric placing is justified; even best. These reasons need to exist to justify. Let the portraitist notice how the effect of atmosphere, height, comfort, dignity, vivacity, etc., are created by the placing of the head within the margins. Let him cultivate by continual experimenting with every negative from which he prints the faculty of judging more easily, as time and experience beget proficiency, just where to put his subject inside its

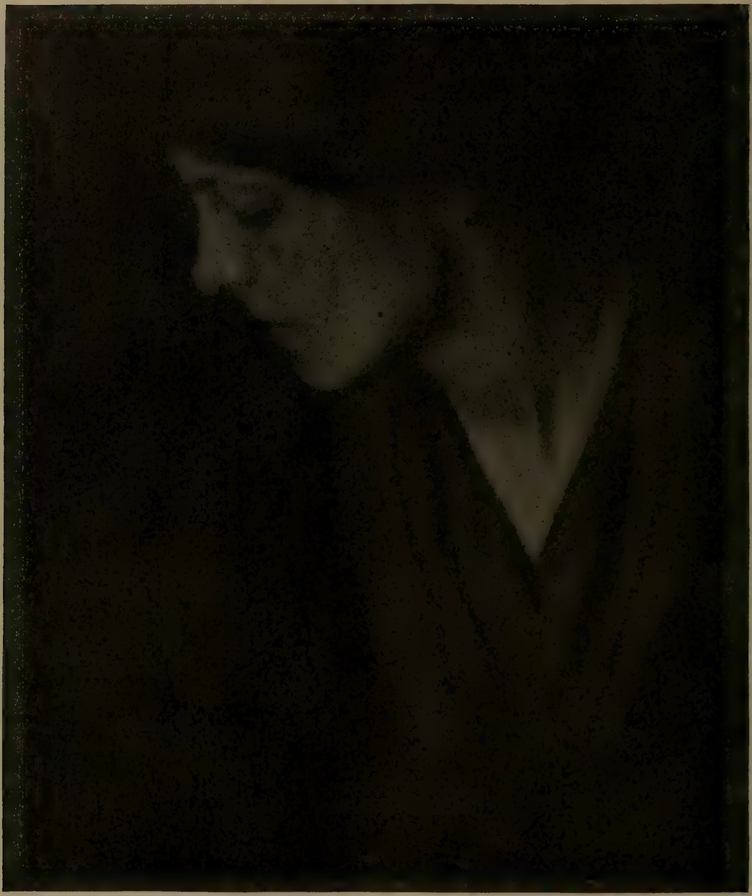


FIG. 1

"frame," and instinctively he will do what is right.

The writer, for the purpose of evolving some practical rule, has for some months been watching the practice of the ablest men he knows, or whose work he has had an opportunity of seeing. Such a rule is almost lost in the number of its exceptions; but it will serve. This is the formula: Divide the portrait in three equal parts, the middle of the face should come close to the line dividing the two upper thirds. In a plainer statement: If the print be four by six, we draw a line across from side to side two inches from the bottom, and another two inches from the top. The middle of the face should then be close to the upper line. We assume of course that the photographer will not attempt to put a head on a four by six as would be warranted only by a five by seven or larger, or so small as to be lost in an expanse of air.

The effect of tallness may be given by somewhat raising the face, and shortness be suggested by lowering it below the line spoken of; but this must be discreetly done lest the likeness of the subject be spoiled. For, be it noted, there is a verisimilitude essential to a good portrait that takes in feature, expression, character, complexion, and size. For example, we have seen the portrait of a petite, vivacious damsel so largely put down on paper as to appear bloated, heavy, and assertive.

The limits of time, space, and intention deny the possibility of entering a more elaborate expounding of diagnonals as related to placing the head, but each reader who is sufficiently interested may discover many interesting things for himself by drawing a line from corner to corner of the portraits that please him best, or, better, the portraits that please most purchasers of portraits best. He will find, for one thing, that there seems to have been an instinctive obedience to some unwritten law.

So much has been written of the triangular composition, the Hogarthian curve, balance, and what not, and so little about the simple things that pass notice from their very simplicity, that we strongly urge the men and women who seek to prosper to study the practices of others, and to make such deductions from their studies as will help them prosper.

BOOKLETS FOR ADVERTISING

SOME booklets are good, some good for nothing. But there is no necessity for abusing the booklet idea because one is bored with a lavish inpouring of badly printed booklets, whose particular sins are poor paper, freakish type, crowded matter, miserable display, and "bound" to beat the best set of nerves that ever essayed to open them. For uncut pages, smudgy cuts, and pages tucked together one-quarter their depth are trifles which well nigh unhorse the best disposition.

That there is a growing need for booklets in every business is undisputed, especially a business dealing in luxuries such as photographs. Public opinion needs stimulating constantly if we aim to provoke a steady demand for portraits.

Now, as to the kinds of booklets that are suitable for the photograph business.

If you have just opened a studio, issue a booklet well illustrated with choice specimens of portraiture and several scenes about the studio, giving a general description of the rooms, the equipment, the styles, and prices.

Once a year such a booklet should be issued by every studio, whether in village, town, or city.

Remember the day of "directions" for "what to wear and how to appear" is ancient history. People who can afford high-priced portraits are generally well dressed, and their costumes can be made to appear to advantage by skilful lighting, if you know how.

Again, to the class who can only afford ordinary grades of portraits, such directions are generally superfluous, because their limited means allow them only a small variety in dress.

But the following clause will offend neither high nor low, and covers the ground, viz.: "Please bring plenty of gowns, that you may have a good selection in your proofs."

How easy it is to ask a woman to bring several dresses. She considers it a compliment, and nearly always complies, accepting it as an honor to have "so much pains taken with her."

Then, when she arrives with her gowns you can freely discuss tints and styles without giving the slightest offence. It at once proclaims you a past-master in portraiture, that you know something about costumes as well as cameras.

From all parts of the country I receive scores of letters of inquiry—"How to do this?" "How to do that?" "How would you improve my pictures?" "What must I do to better my business?" "I understand photography perfectly, but wish to make better pictures, that my trade may grow by reaching a more appreciative class; what shall I do?" "Please tell me how to get up a really nice booklet," etc.

I wish I could personally visit a great many studios, staying a few days in each, answering questions about advertising, and showing how to put pictorial effects into their photographs—how to compose a picture. There are hundreds of little points about picture-making and business methods that could be answered so quickly if face to face with the inquirer.

The effective booklet must be worded very carefully—a little "froth" dashed off at random, or a little chit-chat, will not do. It must be written by some one in intimate sympathy with the portrait business.

The writer of booklets on clothes-wringers, horseshoes, insurance, and "everything" can present only *general* arguments. But to have the booklet read right from the customer's standpoint requires a sympathetic pen wedded to the business.

Next, the illustrations. If you cannot afford good half-tones, *well-printed*, use no illustrations at all. Because a poor or even *half*-good illustration is *positive* danger. The cheap appearance at once proclaims yours a *cheap* studio. (People of sense reason that if you put out such a botch of a booklet, your portraits will have the same character.)

One or two really good illustrations outweigh a volume of common cuts; and all the rhetoric at your command will not rescue the poor impression given by the poorer cuts.

The printing, too, demands the most exacting attention. There are plenty of places where artistic printing can be had that costs no more than an inartistic job.

The country newspaper and job office combined is no place to have a fine booklet printed. Place your order with a first-class concern offering a fine variety of type, border, rule, etc., and who make a specialty of half-tone printing. Bear in mind, please, that the best half-tone block made can be so poorly printed as to defeat all the good presswork in the solid or descriptive matter.

I have seen attractive-looking booklets (from the outside) which, upon opening, disclose the most beautiful typography fairly groaning with despair because the adjoining illustrations were flat impressions, smudgy, and disappointing, on expensive paper, too, which all the more emphasized the *caricature*. It is like wrapping a raw potato in a silk scarf or mounting a miserable print on immaculate vellum.

Attractive booklets can be arranged without illustrations, but the booklet that has "nice pictures" in it will do ten times as much good. Have no fear, the extra outlay will pay good dividends.

What is your opinion of the booklets that come to your desk? Do you not, by preference, read the ones that have good pictures?

Whatever your specialty, you should have special booklets upon the same ready for immediate use.

If babies' and children's portraits are a feature, you should have on hand a supply of pretty illustrated booklets all about babies, which you should mail to every mother in your field. Watch the birth-list in the newspaper, and when baby is old enough—three or four weeks—mail a booklet to the mother with a nicely worded letter.

If brides' portraits are your hobby, send a well-illustrated booklet with brides' pictures, and a carefully considered letter to every lady in the land who has just taken to herself a husband. Consult the marriage list in all the newspapers in your field for data.

Again, should copying and enlarging be your specialty, watch the death list in the newspapers, and after a reasonable time—say three or four weeks—mail an illustrated booklet on enlarging and copying to the family, with the right sort of a letter, and so on with all branches of the business.

If the people thus addressed do not respond within a reasonable time send another copy of the booklet with a different letter. Do it the third time, if necessary; and if the business can be brought your way at all the third letter will generally bring it.

These letters, however, must be written in just such a way to do the work. If you haven't the skill to build such an epistle secure the services of someone who knows how to arrange "follow-up" letters.

This brings us face to face with the old argument, the sound argument, upon which all advertising is based, viz., *persistency*. Keep at it everlastingly until the people believe in you and your work.

A word about mailing your booklets:

Always send in a neat envelope, sealed, and with a two-cent stamp. This will ensure it being opened and read by the person addressed, otherwise it will go to swell the waste basket.

Have *no* printing at all on outside of envelope; it then appeals to the recipients privately, and will command more attention.

Use good stock for your envelopes. No thin, manila bound, but an envelope of good weight, substantial, and of light tint, preferably white.

Besides the regular annual distribution of booklets, you will have occasion to use them very often to attract visitors. Keep your eye upon the society columns. Every visitor announced should immediately receive your best booklet. Keep your eye upon the community as well as your camera—a little long focussing outside the ground glass will develop many a dollar.

Summed up, a modest "ad" in your newspaper, together with good booklets, issued at proper time, are strong levers to lift trade—IF the "goods" (your pictures) are all right.

This is the all-important question right straight to you. Are your goods all right? If not, all the booklets ever printed cannot help you. Remember, your work is your *best* advertisement.

It stands for or against you. See to it that your work is in your favor. Study picture-*making*—COMPOSITION, I mean. You'll certainly need it in the near future. There is a class of customers in every village, town, and city that will pay well for a picture, as well as a likeness of themselves. I am speaking from experience, having developed a high-priced trade upon "*pictorial*" qualities in my portraits—qualities that command $10 to $45 for twelve choice prints, without an argument.

I receive hundreds of specimens of portraiture from all parts of the United States, with inquiries relative to booklets and other mediums of advertising. But alas! a large number of them lack the pictorial element that would place them high on the plane of picture-making. The chemical work is faultless, but the pictures lack the assistance of good composition to command high prices and a reputation for you as an *artist* as well as a photographer!

Do you aspire to reach the top round of the ladder of photographic success? Then arm yourself immediately with a thorough knowledge of composition and pictorial qualities. Not only know about them, but know how to do it yourself!

This is an age of action, and those who dilly-dally along the wayside, putting off their *composition study* will silently drift into the rear ranks.

Sound the alarm! Don't be satisfied to rest on your oars! "To rest is to rust!"

Many a professional photographer has quietly prepared himself along the art line, and has built for himself a prominent name and envied business; many an amateur, too, whose average knowledge of chemicals and camera is way below yours, is making portraits, good ones, too, full of art feeling as well as likeness. Silently they are usurping your field. Will you stand idly allowing them to outclass you? Will you let their knowledge of composition walk away with your heritage?

Printer's ink will do much if backed up with good work. But have a care. There are changes going on; rapid changes. Look to your laurels. Study, study composition and pictorial photography; put it in practice. Then your booklets and other ads. will win your a substantial patronage and an honorable place in the profession.

RUNNING A HIGH-CLASS STUDIO

By L. HAWEIS

THE method of running a studio depends upon three conditions: What you can do; How you do it; and Whom you do it for.

The photographic studio is a trade or profession—is, in fact, what you can make it. The less of the personal element that predominates the more of a trade it becomes, and *vice versa*.

What, in short, is it that you want to do? Are you after the volume of trade or high prices in particular? Will you cater to the masses, the vast and predominating demand for a reliable map of the human animal dressed as the dolls of social requirement? or, Are you striving to appeal to the nobler instincts, character, and refinements cultivated and fostered by the high exponents of a latter-day civilization? Given the ability, this question, or something like it, is the first that you will have to decide. And you will decide it by what you can read into the practice of it in the way of modification with reference to your own particular necessities and devotions.

Personality is the most elusive thing in the world; but, whatever it is and whatever it means—that is, how it reacts upon our fellow-mortals and to what end—these considerations at any rate may be differentiated for the purposes of this note. We can say, for instance, that the man who attracts us, with whom we feel personally at ease, whom we respect before we know (whether we respect him afterward or not), who can make us forget ourselves in the interest of his society—that man has Personality.

I mention these points in illustration of that phase of personality which lies on the surface; that, like the sparkle of some precious metal in a chunk of dross, attracts and interests from the outset. And, for a client, the moment he enters your studio, to feel interested and attracted by the personality of the photographer is half the battle of the business.

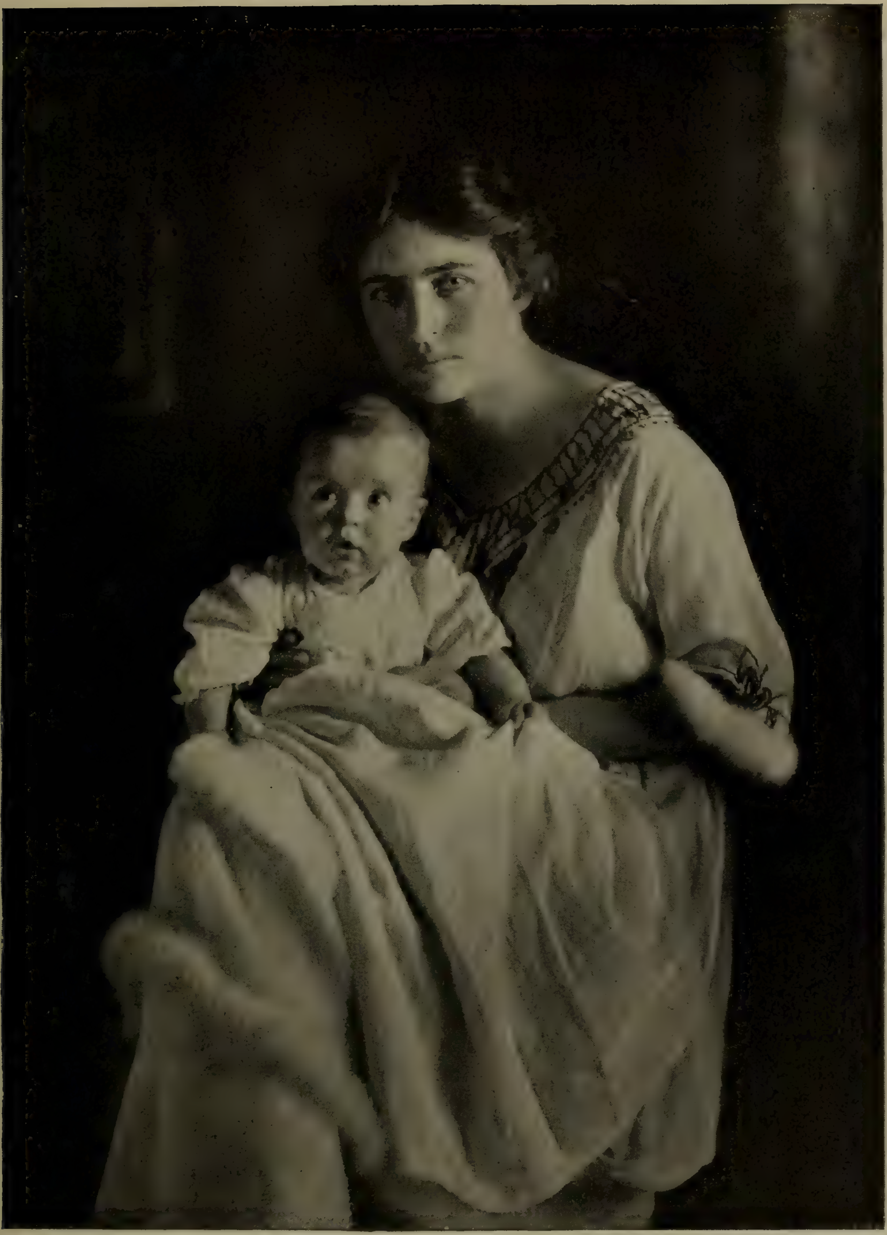
And yet this man may be a cold enough fish when you come to know him better. That points to the fact that personality on the surface only serves one purpose—if a very valuable one; that other, and perhaps "better part," reveals itself only gradually through prolonged intercourse and better acquaintance. Interest must be sustained beyond the reception-room, beyond the skylight, and beyond the threshold of your business. It must invade the innermost sanctum sanctorum of clients themselves; its influence must be felt there, where the surface-sparkles cannot reach to illuminate.

To be poor in either of these qualities, gifts of personality, is to be the worse for it: In the first case interest will be inspired but not sustained; in the latter, the interest can only operate after the tools of enforced social intercourse have mined and brought it to light.

The next asset of the photographer, whatever his personality, I put down as Tact. Tact may or may not be a feature of your strong-personality man, but if it is not he will suffer grievously in his business relations with clients.

It has been said, and very truly, that the money of a photographic business is made in the reception-room; consequently, if you are wanting in tact and resource, if you are naturally impatient and have difficulty in concealing annoyance, leave the business end of your establishment in the hands of one perhaps not so gifted as yourself, but who has just that modicum of tact and good manners which in many businesses, and it may be in yours, is worth all the personality of a dozen others like you rolled into one.

After all, your reputation must count for something. People come to you—the heaven-born artist—knowing that you can and will do them justice. They come to you for pictures; take them,



By MAY L. SMITH
BINGHAMTON, N. Y.

and without unnecessary delay. Prices and styles with proofs. That is the ideal way. The discussion of prices with such as I have in mind is the fly in the ointment; for, remember, the best class of client, to whom perhaps you are no whit inferior intellectually, is in its way just as touchy as yourself. A dollar more or less to these people is nothing, provided they get what they want. Of course, even the best studios are not visited by exactly the same class of people throughout. That being so, how much better to leave all classes in the hands of your receptionist! Rather than talk prices let her prove and exhibit to clients the value and virtues of your work. Satisfied with this, the last qualm is dissipated, and they enter the dressing-room fully aware of the satisfaction they will receive at your hands.

But there will enter those—strange to the special working of your establishment—who will demand prices and styles before they sit; and there will be times when the proprietor will be quite unable to avoid them without rudeness. In that case, he must do the best he can. Under these circumstances, he would be well advised to have a little conversation ready. Having replied to a number of questions in terms of cash, he may find his opportunity in such wise:

"But I really dislike discussing prices, especially at this stage. It seems to rob me of my chief pleasure in taking pictures."

Thus, the personal note is introduced, and, noting the effect of this little speech, he may then confidently continue:

"You know, what appeals to me is that my clients should feel satisfied from my pictures that I can do them justice. If that should be so in your case, this is what I propose to do: You have told me what you would like," (or "I have seen which are the styles you most favor"), "but I would suggest that I take several different positions in several different sizes. That is my usual custom. It really is more satisfactory than sitting for one particular style and size, as it gives you a choice you would not otherwise have. It also affords me an opportunity of showing what I can do in your own case, and it will cost you nothing but a little extra time. Indeed I would go so far as to say that, if you have not ample time at your disposal now, I would suggest you make an appointment for some other day when you would be more at leisure. Nearly all my work is by appointment; but my convenience in this matter shall be yours. Then when we have the proofs you can decide which shall be finished off. After all, we can do nothing without the negatives, and you can have them completed in any style and at any price which you may then decide upon. What do you think? Shall we try several positions, including, of course, some of those you fancy?"

In nine cases out of ten this personal bait will be swallowed—as, indeed, it should be. It sounds good, to most people, in my experience; it proves workable, and the principles are sound.

"And if none of the pictures suit, how do you arrange?" perhaps the client asks.

"Well, you can sit for your pictures as often as you like. No charge is made for this. That is the only way I can guarantee my work; and by that means I am sure that none but satisfactory pictures leave this gallery. But I very rarely have any re-sits, owing to the number of positions I take in the first instance. Re-sits are troublesome to clients; but those who desire to re-sit are welcome as often as they care to visit me for that purpose."

This is straight talk. It is more: it is straight dealing. It is more: it serves to emphasize the personal equation for which people will pay.

And the third requisite is Taste.

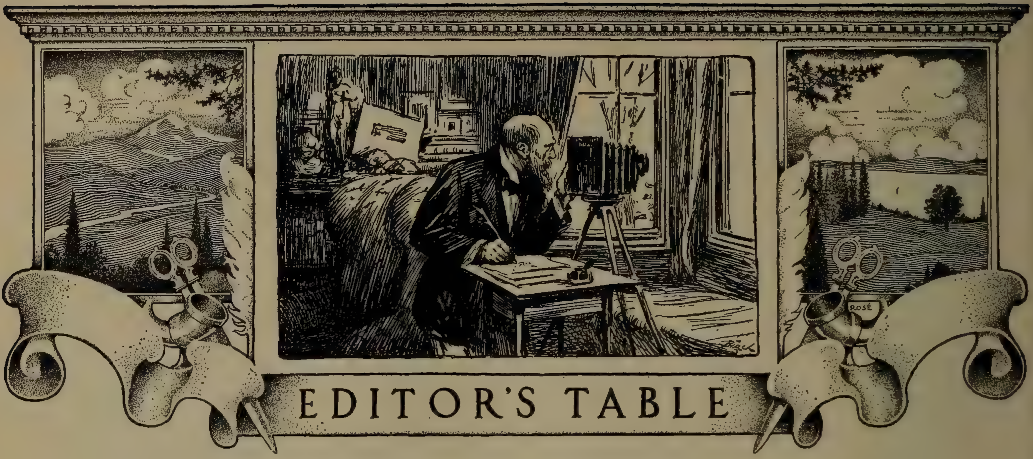
As soon as a client enters your premises, she should find that about her which will move to admiration, or at least, not incite to antagonism. Everything should be orderly, clean, and in good style—the style of the proprietor—for "style is the man."

If you care to make it so, the reception-room can be "homely," furnished and upholstered much as you might choose for a living-room, not sacrificing anything, of course, in the way of viewing convenience. The lighting of the pictures should be good, just enough and not too much. It is hardly realized, or, at least, it is rarely practised among the fraternity, or even by exhibition committees, that photographs are best seen by reflected light. This is fairly common to find in the case of, say, big-framed portraits; but the principle applies just as much to small work, and, given the taste and desire, it should not be impossible so to arrange practically all pictures on show in such a way that they are never seen in direct artificial light. If daylight, it must at least be soft and diffused.

And the less obviously a showroom is a showroom, the better sort of showroom it will be—the more restful, the less distracting. Relegate to an anteroom, if possible, all evidences of business—desks, ledgers, pigeon-holes, and the like. Keep the cash department in the background, as you may find it, as I have found it, more satisfactory to keep the actual discussion of prices until the time you can discuss such matters with the proofs before you. The mere viewing of the proofs tends to distract clients' thoughts from the cash consideration. This does not necessarily mean that you take no deposit, although, in the case of guarantee work and no charge for re-sits, deposits are apt to lose their extrinsic value. It might be your business rule that every client pays a fixed sum before sitting—say, $10—what you will, that is your affair. But with the class of client I have in mind you will probably find you can do without even this business method. If so, all the better. At the least, you can use your discretion. And this is easily done, since your receptionist, in the course of her duties, may mention casually that the same nominal deposit is required of everyone as a matter of form. The best time to arrive at the actual price of the order is with proofs before one. You stand a much better chance then of getting your full price without rebate, and you can, at the same time, best prove your reasons, if required to do so, for charging such a price.

Every picture, you can then explain, is treated on its own merits. Thus, to say that your mounts are designed by yourself and executed under your direct personal supervision on the premises, and not in California, or Montreal, or New York, means that they are exclusive. You do not buy ten thousand cards and retail them with pictures attached. You do things differently. Having made the pictures you proceed to build the mounts to suit them. This means that you provide a more tasteful picture, regardless of price, than your clients are likely to get elsewhere. This line of talk presents a direct appeal to the client's taste for quality, exclusiveness, and personal attention, which in most cases will obliterate any desire to cut price, a thing which you must never do under any circumstance, unless you can see exactly where is the actual tangible return for such concession.

Is this business? I believe it to be business of the best sort, since such methods tend to carry the interest of the transaction into the homes of clients, while at the same time it lifts the whole matter above the level of an ordinary business deal.—*British Journal Almanac.*



EDITOR'S TABLE

IMPROVING YOUR WORK

POSSIBLY a word or two urging the necessity to keep ever-present in one's mind the desire to do fine work may not be amiss, as at times one is apt not to give much thought to the matter. A dozen photographs reach more people than the most elaborate and expensive form of advertising and are subject to a varying and merciless criticism. Rest assured that if you send out a picture with something lacking in it some one is going to find it out, and presto! away goes its advertising value, for if one person mentions it the rest see it immediately, and the picture is useless as a business getter.

Set your prices way up and then hope for greater in the future, and in setting the price consider the time you have spent to acquire the knowledge and experience. The public who buys your pictures and makes you a permanent business connection is looking to you all the time for finer and more dignified work. It may seem strange sometimes that people who display taste and spend money on other things that they surround themselves with in their homes, buy cheap (and, of course, inferior) work in photography. The explanation can only be that they consider them temporary and in time will invest in good work from a high-priced man, who from that time on will have a stronghold in the family simply from comparison with the former work; for invariably they will avoid the man from whom they bought in the first instance, for it will be impossible for them to associate his name with a quality output.

Good work means time, patience, and skill, and some more skill, also the employment of good assistants and the purchase of good equipment. These should be added to the cost of production.

Be absolutely sure that your prices are at a correct figure. The men in the front rank today arrived there by perseverance alone, by an insistent hammering of the value of their work in the ears of the public, and then when things began to come their way by keeping the standard as high as before and mercilessly criticising every print before sending it out.

One occasionally hears of a man who has established himself by an effect which almost amounts to bad photography, when criticised from the technical standpoint. We refer especially to the inclination to produce so-called impressionistic work; but undoubtedly the leading men would agree in saying that it is a bad and most precarious way to try and attract attention. Perhaps it may be underexposure and printing out of focus, or again overexposure and a striving for tonal effects; but sane, far-thinking workers must insist it is incorrect, as it is unsuitable for the everyday customer, which brings to the front the fact that many of the men producing these effects choose their own subjects, as a rule, people with interesting faces, literary men, character subjects, and others which by themselves attract attention. We venture to predict that it would be a huge comedy to put a new-school man in the studio of a fashionable and successful professional photographer. We merely mention this to accentuate the artificiality which surrounds the absurd praise given sometimes to productions of the new school. As a rule, however, impressionistic work of merit usually has individuality, which is a very good point in its favor. The works of Rembrandt, Franz Hals, Velasquez, etc., show that they did not put their subjects off in some dark corner and try to produce some queer effect, but placed them in a good round light that was brilliant and snappy and then went ahead with a clear thought of the subject's characteristics predominating their minds.

It is almost impossible to go wrong if you stick to the examples set by the Old Masters. Take, for instance, one of Rembrandt's strong points, his wonderful shadows; they are simply marvellous, deep, mellow, and tunely shadows; luminous shadows, *not mud*. If one could discover a way to get such results in a photograph he would have a name immediately. How is it to be done in photography, who knows? But when one considers the enormous artistic betterment that has already taken place one cannot help feeling that it will come in time. We were talking to a man, not long ago, who has produced some very fine etchings, a form of art in which it is probably possible to secure more depth than any other medium, and that was the point he thought most open to criticism in photography—the meaningless shadows.

The truth of the statement that you cannot go wrong or be in error to stick to the ideas of the Old Masters is emphasized if you will consider the work of the different leading photographers. One man's work is reminiscent of Gainsborough—the long, flowing lines of grace all suggesting him; another may suggest Rembrandt, perhaps being carefully thought-out arrangements, as were Rembrandt's. Then compare another who, possibly, is working from an entirely different standpoint. His work may suggest Sargent more than any other painter, as they may be spontaneous and have rugged light effects. Of course, though the thoughts are in touch with the painters, they necessarily do not slavishly copy them in technic, that would be stagnation for photography; any one with experience realizes that the means of expressing texture and color are entirely different from painting.

Of course there is great difficulty in knowing where to stop, and it takes a certain amount of skill or knowledge of art principles to know what to adopt and how to adopt it. Certain forms of composition which are remarkably interesting in a painting are impossible in photography. This is especially noticeable in group subjects. We have seen paintings which were fine and charming in the original manner in which they were grouped which would be the opposite extreme in photography. Photography by a clever photographer is supreme in the rendering of texture and facial expression, and if you will analyze the success of leading men you will find it due to ability in one or the other, and in a few very rare cases due to both.

CRITICISM

IF the successful photographer is asked as to the causes which have helped him he will invariably include, and often give a prominent place to, the hints and advice of his friends. He is right; the suggestion from one who has understanding to give it is a very necessary part of our education, and happy should be the man who can claim it.

Just think about this same advice. The result of it is to help the photographer to better work, and therefore the logical conclusion is that the work has faults, and that these faults have been pointed out. The work may not have been condemned, but it has not been flattered. The man has had a sitter in his studio, and he has done his level best. The sitter is pleased with the result—so is the photographer. The friend—the brother photographer, probably—looks at the picture. He has not been concerned in the manufacture of it, and so is better able to see at a glance if anything is out of gear. As a photographer he may appreciate the work and thought which has been put into the print, but as a "candid" friend he puts his thumb over one spot in the print. It may be that the producer of the print at once notices the fault, or there may be some discussion on the point. More than possibly, it will be decided that after all the fault is no fault. In any case the discussion settles the point, or at least leaves it simmering in the photographer's brain to be finally decided later. And so, if it was a fault—and often enough the photographer decides that it is—it will not run through his work until the end of things.

How many photographers are there who do *not* welcome that kind of advice commonly called criticism? Very many; we almost fear a very large majority. How common it is to be shown a picture —or a score of pictures—by a photographer who asks your opinion when he means that he is fishing for flattery. It is a rather puzzling attitude. It would have been thought that a photographer would have welcomed rather than resented criticism. And doubly so, since it can scarcely be denied that the inertia of thousands of photographers as to the quality of their work is one of the leading causes why so many of them are in an insecure position; in dread of the other man and in hatred of the amateur.

Criticism is not always an easy thing. Very often a man's work would require an essay to point out what is the matter with it. For sometimes a man will show work which plainly says that he has attained a fair proficiency in the technic of photography, and yet has not grasped the most elementary meaning of picture-making. How can you tell him such a knock-down fact without making him angry?

There are several things necessary if a photographer would rise. He must always keep a wide-awake and alert brain around his work, and he must feed and educate his brain with the books and the opinions of others. In some respects the spoken opinion is preferable to magazines—both are necessary. In the magazine it is so easy to read the faults of others, and this is comfortable, but not helpful; in an honest criticism we read our own faults or mistakes. A magazine ought rather to start a thought than to dogmatize a fact; and it is so easy to evade the thought and pass on to the next page. In a conversation the effort to think is forced and is followed up.

The good fellowship which has been so much fostered by the conventions has already led to more than one organized club where photographers meet and exchange opinions; and it has created quite a habit in a few cities of intervisiting among the galleries. It is a good movement, and should be helped along. The exchange of criticism is mutually helpful, and none can judge the points which make or mar a photograph as well as can a fellow-worker. Let us then have done with the old notion which angled for flattery and preferred a blind self-deception to the healthy pleasure of knowing one's work and knowing that it is good.

PRACTICAL PAPERS ON STUDIO WORK AND METHODS

Getting Ready for Christmas

I SUPPOSE that almost every studio photographer is now looking forward to Christmas with somewhat mixed feelings, the extra cash coming in being somewhat discounted by the long hours of work. Now much time is wasted in many studios by using apparatus that is not in perfect order. Dark slides that require careful handling to prevent them falling open, cameras with loose backs, and many other little defects of a like nature waste absolutely hours in some businesses. It may, therefore, be useful to look over some likely causes of trouble and indicate how they may be met. This is a good time to set one's house in order, because although a defective piece of apparatus may work tolerably well when time is taken to humor its little whims, when it is used at a real rush job, such as most jobs will be in the coming season, it is liable to fail lamentably.

Let us take the camera first. Almost the most common fault is a loose back, caused by the locking nut failing to grip. This, of course, leads to out-of-focus negatives. Sometimes all that is required is a washer between the nut and the camera frame, but it is often necessary to renew either the nut or the pin on to which it screws. Any of the big makers will supply small fittings such as this. Any holes in the camera bellows should receive attention. If large, they may be covered with black court-plaster, but if only small pinholes they may be filled with a paste composed of powdered graphite in seccotine. This is also handy for filling in any holes in the woodwork. Cracked lens panels are not uncommon, but they should be replaced at once, or trouble is sure to ensue. If it is inconvenient to replace them, strips of wood should be stuck on the front of the panel across the crack, and the back should be covered with black velvet. This last is a good tip for all lens-boards, as it not only prevents any possible light-leakage but also makes sticking of the lens-panel almost impossible. However, all cameras will not permit of the slight extra thickness.

Any missing screws should be replaced; sometimes they seem of very small importance, but their absence throws a great strain on those that remain. If the screw-hole has become enlarged it must be pegged with wood; match-sticks are often useful; they should be smeared with seccotine, forced well into the hole, and then cut off flush with the woodwork.

It is a risky thing to use an unsafe dark-slide at any time, but when doing rush work it is simply asking for trouble. A most annoying defect is the coming unhinged of the center partition. This usually becomes slightly displaced with the result that the slide either refuses to shut at all, or shuts incompletely; in the latter case fog is almost sure to result. Cloth hinges may be replaced by anyone of average dexterity, but metal hinges, unless it is just a case of lost screws, should be handed over to an expert. The catches holding the slides shut often become loose, with disastrous results. In the case of the L-shaped catch, now generally fitted, a tap with a hammer, to bend in the outer end of the L, will often do much good. Safety catches to prevent slides being drawn except when required, often get out of order, but a screw-driver, a pair of pliers, and a little common-sense will usually bring them right again. Tripods are usually kept in pretty good repair, because it is next to impossible to work at all with a faulty tripod; but sometimes the ferrule becomes loose, which results in slipping, and much annoyance.

I have left the shutter to the last of the camera parts. Sometimes a roller-blind or studio shutter may be improved in its working by cleaning its working parts; a few slight adjustments are within the scope of the average "Pro," but serious damage is almost sure to result if anyone but an expert tackles the repair of a diaphragm shutter.

The lenses are unlikely to benefit by any attention other than a good cleaning, which they should certainly have.

To depart from the actual operating gear: The enlarging lantern should be overhauled, and lamp-house and illuminant thoroughly well cleaned; but the most usual trouble with lanterns is a jerky focussing movement, which is often caused by looseness of the clamping screws. A great improvement may often be effected by rubbing graphite from a leadpencil in all the places where wood slides over wood.

Any stray light from the lamp-house or from the body of the enlarger should be cut out; it is a most frequent cause of fogged paper. The easel will probably repay a little attention; the clips, bars, or whatever it is that holds the paper should be adjusted, and if the easel is one of the type that folds back for placing the paper it should be seen to that it comes up truly vertical, or else it will be impossible to get sharp focus all over the enlargement.

Printing boxes are usually kept in good order, because any defect is at once noticed; but it is as well to see that the arrangement for providing pressure on the paper is in order, also the felt pad should be renewed when becoming worn, or else unsharp prints, and even broken negatives may result.

In the dark-room the safe-light should be cleaned, broken dishes or even cracked ones should be replaced, and any taps that require washers must be attended to.

The dry-mounting press may be heating unevenly, which may result in the print sticking and the fissure failing to do so. This may be improved by a thorough cleaning out of the heating system, and, in the case of gas, by having the pipes blown through.

This note is not intended to be a complete list of all the ills that apparatus is heir to, but it may serve to point out a few of the most usual points to look to.

In conclusion, it is always as well to get in a small stock of "breakables," such as focussing screens, dishes, and bottles, before a rush. Then any accident is not so serious.—*The British Journal of Photography.*

The "Finished" Appearance of Good Quality Work

"FINISH" is to a photograph what paint is to an Atlantic liner. Which is saying that though finish may be only a minor part of photography, no photograph will get very far without it. I do not mean by this that every print must pass through a black-and-white artist's hands before making its dèbut, but its finished appearance must be at least as good as if it had received such attention. Such is the appearance of professional quality work, but it is not invariable with all professional work, or with all quality work either.

Broadly speaking, the professional considers finish as an individual process and pays attention to it in proportion to his standing, the class man studying it extensively, the quantity man not at all. Of middle-class photographers, some obtain finish deliberately, and some unconsciously; that is, some employ workmanship to correct and tune up the work when it has left the technical worker's hands, while others rely more on attention to details throughout to bring about results that need no tuning up.

Among the former I have met two distinct schools, one as rare, I believe, as the other is common. The one builds on after treatment of the negative; the other relies on working up the print.

There are also two classes of purist photographer—the absolute and the moderate. The former is not often met with among professionals—his system is certainly worth considerable—but it is the moderate system that has most to recommend it.

To take them in the order mentioned, the method which depends on a negative artist seems a peculiar one, the idea being to obtain negatives by virtue of pencil, knife and aerograph from which junior labor can produce first-class prints. Combined with the employment of an expert negative maker this is a reliable way of producing standardized results, but without the technical man it is poor photography, even though it may produce the finished results desired. It has also the disadvantage of being insecure, depending, as it does, on the super-normal skill of a single individual.

Dependence on "working up" is safer than relying on a negative artist, for black-and-white workers are more easily obtained, and impossible prints can be more easily replaced than bad negatives can. At the same time this system, if carried too far, has its bad points. The presence of a corrective factor is apt to encourage an amount of scamping in other departments. There is always the thought that minor carelessnesses and mishaps do not matter very much when there is someone to "touch it up" or "spot it out." Again, though it is arguable whether a bad print can be touched up and spotted to equal a good print or not, it is certain that the former cannot excel—not as a photograph anyway. Hand work on prints has its advantages, however, as will be seen in the paragraph on the "moderates."

The absolute purists consider the picture's finish (along with everything else appertaining to it) from the moment the decision is arrived at to make the picture; that is, before the first plate is exposed, and by careful attention to every detail produce with a minimum of retouching prints that if correctly trimmed and mounted need no further finishing. Some may think this hardly possible but really the photograph made purely by good technic can be equal to and more convincing than any hybrid product. Unfortunately there is one disadvantage. Admirable as the method is for a serious amateur—usually most keen on fakes and doges—the amount of deliberation and care necessary to do it justice is more than the average professional's quantities of work and rate of working will allow.

This brings us to what I have called the moderate way, which is the commonest of all, and if worked out with deliberate thought for the final appearance (and quality, of course) of the print is the soundest method of practising photography

As there are no extremes in moderation, neither scamping at one end or overexerting at the other is permissible. Retouching and working-up are appreciated and made good use of, but they are not expected to perform miracles or to cover up bad photography. Therefore operators and technical workers must do their bit independent of after-help. This makes for good work, while the presence of retoucher and artist gives a certain amount of latitude which is very useful in busy times.

Let us examine the system more closely. To begin with the studio, the operator in charge considers not so much certain unique poses or tricky lightings as he does the finished appearance of the future prints. This will embrace the other, and in fact everything he does as well. To take a picture properly he must know what kind of result he is aiming at. Knowing that, he knows, or should know, what lighting, what kind of plate, and what exposure are best calculated to give it. Not relying on others, he works with intelligent deliberation. The same with the plate development. By treating the plate with a view to the *finished appearance* of the prints, a negative is obtained which is suitable for its intended purpose.

A good negative is a source of pleasure to a good retoucher, and the better it is the less work it needs. And the less work it needs the more likely it is to give universal satisfaction.

The foregoing assertion will meet with some opposition, but I have proved it to some extent by taking portrait negatives under all sorts of conditions, and producing by technical and "moderate" methods results that were more pleasing than first-class studio studies.

The printer of negatives made without system is likely to make prints in the same manner and of a similar nature, unless he or she is definitely required to get supernormal results. When this is the case the work is harder, and more time and material are used than would be if the negatives had had their right share of careful attention in the making. Given the good negatives, it is easy to get good prints or bad ones, the quality in this case depending on the printer and his or her apparatus. If these are inefficient, then "finished" results will not be seen in the printing department, but a lot of work will be thrown on to the artists which might have been avoided. For instance, careless work or poor tackle (by which I mean materials as well as machinery) will produce prints and enlargements suffering from such thins as false contrast, wrong key, want of detail, spinelessness and bad "color," all of which go to mar the finished appearance of the work, none of which can be wholly corrected by working up even were the latter obtainable gratis and without use of time.

The patching up of such faults as the above and others has the same effect on the artist or worker-up as covering bad negatives has on the printer. When such faults are rare, the predominance of good work encourages him and also allows time to give concentrated attention to special work and to those faulty prints which will happen in the best ordered houses. I remember once having a most intricate job to complete by a certain date. It was one of those impossible coying affairs where even the most careful technic must leave most of the picture to be drawn in by hand. Had I been able to settle down to it in earnest it would have been profitable, interesting, enjoyable and a good advertisement. As it happened, however, I was snowed up with an epidemic of poor work at the same time, with the consequence that neither the special job, the other work, or myself were what they should have been.

Which concludes my argument for the careful practice of a system where every worker has the finished appearance of the work constantly in mind and works accordingly.—*B. J.*

The Choice of Materials

THERE is always present among photographers a desire to know what other members of the profession are using, and they are actuated in this by two motives—one is the tendency of imitation of others, and the other is a natural curiosity as to just what is most generally considered to be the best that the market affords. Either motive is good, and, if the inquiries are sincere, it indicates the presence of an ambition to improve the quality of work or to make more money. It is this nervous activity that keeps up the fire of action and aggressiveness that has made the American a symbol of business supremacy the world over. The habit of "wanting to know" is good if it serves to whet the ambition.

In the matter of plates the popularity of any certain brand is generally an indication of its finer qualities. The facts of the case are, that all plates now on the market will yield good results, and it is in the minor details that the popularity of any one brand is established. The first factor is the uniformity and dependability. When a brand works the same at all times, in all climates, and with all kinds of waters it has a big advantage over a plate that varies with the season, or the temperature, or the character of the water. Nothing is so vexatious as to be working along certain lines and then to have a lot of plates go wrong and to discover that it is necessary to make some vital change in the method of handling in order to get back to the standard that has been set. It may be possible that this is due to the manner of making the emulsion, and it may be that the nature of the plate makes it suceptible to such changes. Then, too, it may be the user, for we have found that human nature is very different, not only in different people but in the same person at different times. No man handles a tool with the same degree of skill at all times. He has his "off days," when things will not go right, and, while he is not conscious of treating his materials differently, it is a fact that he is doing this very thing.

Furthermore, no two men treat a plate in exactly the same way. They may work side by side and not get exactly the same results. Therefore a plate that will work perfectly satisfactorily in the hands of one man might not work the same in the hands of another. The consequences is that one man's opinion is nearly as good as another's, provided neither one is an ignoramus. It is practically impossible to state positively which is the best plate made. The nearest that can be approached to a correct answer is to state that there are three or four plates that rank as the most uniform in quality and general workability, and the individual can safely select any one of them and stick to the one that is best suited to his particular style of handling.

In the matter of paper it is pretty much the same, though there is probably a little more variation in the different brands than there is in the lines of plate. The kind of negative a man turns out most regularly goes a long way toward determining the kind of paper that should be adopted, for the negative has a great deal to do with the character of the final print. A light, clean, crisp negative will work well with one brand of paper and poor with another. A heavy, strong negative will require different qualities. Furthermore, the predominate style of a workman may require certain qualities that another style will not. For instance, light, sketchy vignetted work and heavy dark background, low toned pictures will not show at their best on the same grade of paper. Therefore there is good reason for a difference of opinion as to the relative merits of the numerous brands of paper now on the market, and unless prejudice enters into the question it should be determined according to the character of work that forms the bulk of the business of each gallery.

Cards and mountings offer a greater field for a choice of material than almost any other article used in photography, and it is a department in which greater care should be exercised. The demands of the trade, the preference of the owner and the style of work produced are all factors that should have more weight than the arguments of the maker or salesman who is not conscientiously considering the welfare of the purchaser. It is like style in clothes. A sober matron has no business in the gay colors and beribboned folderols that become youth. The clothes should be worn with some regard to the character of the wearer. Mountings should be purchased with some regard to the user. The steady but not overly brilliant workman should use those designs that are excellent in quality but not extreme in syle, while the more talented and, perhaps, more brilliant workman may indulge in the more radical styles and his work will carry them gracefully and effectively.

A photographer who cannot make a style that is dashing and distinctive should not attempt to use mounts that are made for and adapted to work of that character. He should stick to the more conservative styles and shapes. A plain cabinet picture is inappropriate when mounted in a long panel folder that is extremely extreme, it spoils both picture and mounting; but a sketchy panel picture properly worked up and made for the style will set off the mounting, and the result will please that element of patronage that is appealed to by the smart and unusual article. A photographer whose abilities and imaginations lead him into a desire to make extreme styles, should give a little rein to his ambition and, even if the customers do not ask for the work, make a few extras and put out for exhibition some of the more novel styles. In time people will begin to appreciate them and the demand will gradually grow, and a photographer who can and does make unusual things always attracts more attention and gets more advertising than one who sticks doggedly to the old conventional forms.

In studio appointments there is a wide latitude for choice. Many photographers in small places, that cater to a trade that is liable any day to come in with muddy feet and the soil of their work, are of the impression that a carpet or clean floor covering is not only useless but a totally unnecessary expense. Therefore the floor is neglected and becomes splintered and full of dust and dirt, and this spreads to the walls and other fixtures, and it soon becomes impossible to keep the place in a presentable condition. Gradually everything is neglected, until the old shack is a sight. In traveling about we have found a number of studios in communities where the farmer and working man are the mainstay of the business, and we can state from actual observance and knowledge that it is possible to keep a neat floor in a country gallery. A hardwood floor is easily kept in shape if occasionally waxed, and it seems to be the most satisfactory, for the dust and dirt do not stick to it, but come off easily. Then, too, aside from the path made from the entrance to the desk, which gets the bulk of the wear and dirt, it is possible to lay rugs and matting, and no matter how rough a customer may be, he will respect a clean floor and will not track in mud and dirt if he sees that an effort is being made to preserve a clean and attractive studio. If the place looks dirty when he enters, he will have no compunction about tracking in more dirt or throwing things on the floor.

Lace curtains and gew-gaws are not necessary. We have seen a number of most attractive places where there is hardly a hanging and, occasionally, no rug or carpet; but the cases, tables and chairs, and other fixtures are all in harmony and kept clean. Personal taste has a wide field in the selection of studio appointments, but if there is no particular trend to the taste it is difficult to make it attractive, no matter how much is put into the room. This is also true of the posing room or studio, better known as the operating room. Poor equipment will do good work in the hands of a good workman. Frequently it is a wise policy to get new equipment and accessories, not in order to improve the work, but to make an impression on the customers. In selecting new grounds, chairs, or other adornments of the posing room, thought should be given to the effect on the customer as well as on the convenience and help in doing work that exhibits more class and charm. Many think that it is not necessary to buy new appointments if they will not aid in the improvement of the work. This is not always true. It is wise to occasionally get something new for the effect it will have on the customers. It pays to cater to their sense of appreciation, for they are the ones to be pleased, not the proprietor.

It is hard to convince photographers to put in new and attractive things when they are not inclined to believe that it will pay. It will not pay to simply renew some of the old grounds or accessories or equipment with things just like the old ones. To choose something entirely new and different, something that will make a noticeable addition to the place, will pay, but the matter of choice must be well considered.—*Trade News.*

Commercial Work and the Portrait Photographer

Should the portrait photographer take on commercial work? On this question, which is constantly coming up anew, the following points should be given consideration:

1. In a small town and in some small cities it is necessary for the photographer to do all kinds of work in order to maintain sufficient volume. Many photographers prefer a small town for this very reason, enjoying the greater variety in the problems presented.

2. Specialization makes for greater proficiency. The photographer who is in a position to devote himself exclusively to portraiture will think more intently upon portraiture and will generally become more skilful at it than the photographerwho allows his interest to be distracted to other fields.

3. Commercial work should not be attempted unless the photographer has the equipment and necessary knowledge to do it right. A commercial job poorly done is a boomerang. Indirectly it will undermine the reputation of the studio for good portraiture. The future portrait prospect who sees the poor commercial job at once infers that the quality of portraiture done by the studio is equally unreliable.

4. Some kinds of commercial work can be taken as a sideline better than others, particularly work which can be done in the studio, such as copying, enlarging, and photographing samples for manufacturers, advertisers and the like. Some special equipment may have to be installed, perhaps a special workroom, but the work itself can be sandwiched in to even out the peaks and valleys of the regular trade without inconveniencing patrons who may come in for sittings. In this connection it may be added that every well-equipped studio, according to photographers of wide experience who have been asked their candid opinions, should be equipped with good enlarging apparatus.

5. People who patronize the city studio for portraiture are sometimes prejudiced unfavorably by the mixing in of commercial work, if it is made noticeable to them. If commercial work is handled by the portrait photographer, it is therefore advisable to keep samples off the walls or in a separate room. It has been found best to make the same distinction in advertising, confining the general advertising to portraiture and getting the commercial business by more direct methods—by letter, printed folders, or personal solicitation.

6. Commercial work if efficiently handled, may be made the means of increasing the photographer's portrait business, as it brings him into close touch with the business men of the community, who are often the hardest class of people to get into the studio for a sitting. As Mr. Business Man goes through the reception-room to the "commercial department" he naturally pauses to look over the samples of portraiture hung upon the walls, and is impressed, so that the photographer who is anything of a salesman can frequently sell him on a personal sitting before he gets out of the studio. This is the old idea of approaching your prospect indirectly and getting him into a situation where taking action involves no inconvenience and no effort on his part.

7. Certain kinds of commercial work are much more expensive to handle than are others, and unless costs are carefully estimated the work may be done at a loss without the photographer's being aware of the fact.

8. No business advantage is to be gained by being a dog in the manger. A customer will be favorably impressed rather than unfavorably if the photographer tells him plainly that a certain kind of job, to be done right at a reasonable price, requires facilities with which he is not provided. Whether it is advisable to take such work and farm it out is a question for the individual to decide, but most photographers do not wish to be bothered to this extent, as the commission it is possible to charge is small, while they must also be answerable for the quality of the work although not done by them.

9. Portrait photographers who have a periodic itch for outdoor commercial work as a sideline, feeling cramped by studio restrictions, should consider that what they need may be not a change of work but a good vacation, or at least a larger allowance of time for exercise in the open air. They would also do well to consider home portraiture as a better sideline, since it will give them the change they desire without distracting from their specialized field. Home portraiture has done considerable to improve the quality of portraiture done in the studio, since it takes the photographer out of a rut and suggests new compositions and new lightings.

The foregoing points are not offered as a complete symposium on the subject, but if they are given due thought by the photographer with this old question of commercial work to settle they should help him to answer the question as will prove most profitable to himself.—*Portrait.*

The Biggest Help

The other day we were talking to a photographer of wide experience who from a very humble beginning, twenty years ago, has risen to a position at the top of the profession. After a conversation of an hour or more touching all phases of up-to-date studio operation, we asked him this question:

"If you were to select from all your experience one big idea for the too much neglected small-town photographer, what would it be?"

And this was the answer that came back:

"Tell him to learn retouching. That is the thing he needs more than anything else, and the thing he most neglects. Everyone who has been in the profession any length of time and knows the public knows that, except occasionally, it cannot be satisfied with pictures printed from unretouched negatives. Inability or indisposition to retouch is often the only thing that holds the samll photographer back, and yet in how many cases you find that he will not take the trouble to learn. My advice to him would be to go away, if possible, and take a few lessons from an expert—anyone can learn—or, if he won't or can't do that, to get some handbooks on the subject and dig the thing out for himself. That is the way I picked it up myself at first, learning different dodges from other photographers as I got the chance."—*Portrait.*

Results

The old saying that there is no royal road to success applies to photography as to other things. Success comes to the photographer who plans and works intelligently, holds himself to the course he has marked out, and faces the world with courage and a smile.

Brilliance of intellect and of artistic perception plays its part in the careers of some men who have won great reputation, but most of us belong to the class which can boast only average mental power—the class which accomplishes the highest average of results. The man who feels that he is lacking in certain attributes which seem to distinguish others of his craft does well to remember this, and to put with it the thought that interest in one's work and determination to improve on past achievement are fully as irresistible as genius.

Photography is an art of many phases, presenting opportunities varied enough to stimulate at many points, but the big rewards go not so much to the men who work by flashes of intuition as to the men who give their problems patient, careful study and master the technicalities of their craft by steady plugging.

It is stated by those who have studied scientifically the ways of men, that the best of us is only 3 or 4 per cent. efficient—that even those who achieve the greatest success do not begin to measure up to the native capacity that is in them. Lost motion, carelessness, wasted effort, indolence, distraction from the chief business of the day—all take their toll, and men remain inefficient at the business which they undertake, however productive they may appear to the casual eye. Thus the man who merely sets himself to strive with undivided effort toward the objects which he has in view can, with an equipment even lower than the average, achieve results that would be a credit to a higher type of brain.

Learn to make good pictures. Do not be satisfied with passable results. There may be only a few who can produce the work of genius, but good results—pictures that will be approved by discriminating critics and by customers that want the best—are well within your reach. Do not stop short when but half way to success. The power is within you; work on up to the height that you would reach. If you think you can do it, you can. Face the world with courage —and a smile.—*Portrait.*

VIEWS AND REVIEWS

The Business Situation

THE business situation, as we see it along the photographic lines and comparing photographic business with all others, brings out two things prominently:

First, the decline in the price of merchandise is not coming immediately, and when it does come it will be very gradual, just a little at a time. Even before this decline sets in, prices on many things will increase rather than diminish. The Wollensak Optical Company have just recently raised their prices of lenses. Why? Because of the increased cost of raw material and labor, two things that will always keep the prices going up as long as they advance. The increased cost of freight, express, etc., must also be added to the price of goods. The closest students of the situation, men who have spent years at it, believe that things will go higher in the photographic line before they go lower, with possibly a few exceptions.

Several months ago there was sort of a country-wide flurry in prices. Mr. Wanamaker, in Philadelphia and New York, put a 20 per cent. reduction on everything in his stock.

Neither the manufacturer, the wholesaler, nor the retailer is overstocked; all manufacturers are way behind on their orders; the only time goods have declined in price is when the manufacturers had a large surplus stock they were compelled to move.

Everyone you talk to complains about the high prices of goods. They admit that wages are too high in every branch of business but their own; that prices are too high for all articles except those they manufacture or sell. The carpenter claims the plumber wants too much money per hour for his work, and the brick mason claims the carpenter is getting more than he earns. In fact, every man is looking out for himself and trying to down the other fellow. He is not receiving as much in wages as he should, the other man is receiving more.

The papers were full before the recent increase of how the switchmen employed on the railroads were underpaid. The writer was talking with several switchmen a few days ago, and they are making from $300 to $350 a month. It's a business, while it has some risks, that requires very little training, but still they are not satisfied.

Until the prices of labor are reduced, which will bring down the price of raw materials, high prices will continue, and we can see absolutely no change coming in the photographic lines for many months.—*Ohio Photo News.*

The New England Convention

THE universal opinion was that the recent Springfield, Mass., meeting of the New England Association was easily the best held in some years. Taking his cue from the successful meeting at Milwaukee, Will Manahan, the president, had the floor of the convention hall laid out for the manufacturers so that the first impression gave one the right enthusiasm, making one involuntarily exclaim, "Gee, this looks like a real convention!" Then the program was patterned after the instructive features at the National, artificial light being given the right of way. The picture exhibit, too, was given a more decorative effect and some unusually splendid work was shown.

Three years ago the New England Association was in the dumps. It had little or no money in the treasury, its conventions were getting tiresome and uninteresting, and the New Englanders were fast getting out of the convention habit. Then Will Manahan stepped in, called in the manufacturers to his aid, gave the field a thorough "once over," spit on his hands, rolled up his sleeves, and started in. Today the New England Association has probably more money in its treasury than any other association, it has reawakened the interest of the New England photographers, and is once more coming into its own. The new president, A. K. Peterson, of Hartford, Conn., has everything in his favor, and as he is very popular and will have the support of the manufacturers the next New England convention should be like those of the palmy days of the association, when the attendance was never far short of being equal to that at the National meetings.—*Abels.*

New Ansco Catalog

THE new Ansco catalog of amateur cameras, just received, makes the usual good impression of finely built instruments of precision. It is attractively printed in two colors, and its very readable pages should serve as an excellent guide to the judgment of the prospective camera buyer. The illustrations are plentiful, and depict both the cameras and distinctive features of construction and equipment. Several new refinements are to be noted. A valuable feature which makes the catalog good for reference is the set of depth of focus tables for lenses of 6½, 4⅞ and 3½ inches focus. Copies of the catalog can be had from dealers or from Ansco Company, Binghamton, N. Y.

Advance Class in Art Photography Taught by Clarence H. White, of Columbia University

RECOGNIZING the broadening influence of artistic photography in portraiture, magazine illustration, and as a medium of art expression, the department has again secured the coöperation of Mr. White.

The course is designed for those who have had some experience in photography. It will deal broadly with the following subjects: The Application of Art to Photography; the Proper Use of the Camera; The Manipulation of Negatives and Printing Papers to Secure Pictorial Results; Portraiture by Daylight and by Artificial Light; Working up Prints for Exhibitions, etc.

There will be fourteen sessions, seven in the studio rooms of the department on the first Thursday evening of each month, beginning October 9 and continuing until April 7, and seven Saturday afternoons of portrait work in Mr. White's school in New York.

Anyone interested in photography living near Brooklyn, will be well repaid by attending this special course. It is an unusual opportunity for all photographers.

The tuition fee for members of the Institute is $10.00; for persons not members, $14.00.

Rochester Section Professional Photographers

THE Rochester Section of the Professional Photographers' Association of New York State held its monthly meeting October 4, at Grand View Beach, in conjunction with a banquet, followed by a corn roast given by John H. Heberger at his summer home by the lake. The association was well represented by members, out-of-town as well as local. Among those present were J. E. Mock, L. E. Allen, Irving Saunders, William M. Furlong, Louis D'Amanda, C. L. Goetz, William G. Whithall, Walter Nelson, S. W. Smith, C. J. Schlitzer, George C. Lodder, Fred Moser, B. J. Holcomb, Joseph N. Heberger, Bert J. Tibbals and W. C. Miller, of Brockport. The evening's entertainment was varied. J. E. Mock, president of the state association, outlined plans for the photographic convention to be held in Rochester next May.

The Annual Pittsburgh Salon

THE Eighth Annual Pittsburgh Salon of Pictorial Photography will be held in the Department of Fine Arts of the Carnegie Institute, Pittsburgh, Pa., March 3 to 31, 1921, inclusive. Prints submitted will be passed upon by an impartial and competent committee of selection, and those prints possessing the highest merits in artistic expression and execution will be exhibited.

Entry forms containing full information and conditions of entry in the Salon may be obtained by addressing Charles K. Archer, Secretary, 1412 Carnegie Building, Pittsburgh, Pa. Last day of entry, Saturday, February 5, 1921.

Monthly Discussions

THE Department of Photography of The Brooklyn Institute of Arts and Sciences, under the active management of Mr. William A. Alcock, the vice-president, has arranged a series of monthly discussions and criticisms, which are the outgrowth of experiments commenced last year. They resulted in such benefit and interest that they are to be made a feature this season; and they ought to serve as an example to other camera clubs throughout the country.

Each studio member is urged to submit some prints each month. The prints will be hung in the studio in the Department frames and *must be on white or light-toned mounts,* 14 inches x 18 inches or 18 inches x 22 inches. Unless so mounted, prints will not be considered. At least one print submitted by each entrant will be hung. The selections will be made by the Mid-winter Exhibition Committee. There will be a meeting each month, devoted to constructive criticism of the prints hung, which prints need not necessarily be finished in final form, the object of these meetings being to help workers to prepare prints for the spring exhibition and for outside exhibitions.

The following is the schedule that has been prepared and the speakers on the subjects assigned, who will also help to criticize the work:

October 18—Miscellaneous. R. M. Coit.
November 15—Landscapes or night scenes. W. E. MacNaughton.
December 20—Portrait or figure. Charles H. Davis.
January 24—Architecture or still life. Charles I. Berg.
February 28—Winter or sea views. Floyd Vail, F.R.P.S.
March 28—Genre or groups. Announced later.

As a result in a great measure of last year's activities along these lines six members of the Department were represented at the London Salon of Photography this year and eleven at the Royal Photographic Society.

American Prints at the Royal Society

In 1918 only two photographers from the United States showed their prints at the exhibition of The Royal Photographic Society of Great Britain, in the pictorial section. Last year there were but five. This year the work of forty-five was accepted and such a number contributed that, owing to lack of space, it was impossible to hang many pictures that would otherwise have been shown.

The American work was so meritorious, the Society decided to display all of it, whether hung at the exhibition or not, in a special show to be given during the latter part of January and the earlier part of February, to enable British photographers to see and study the American exhibits in their entirety, and thus also showing the Society's admiration of the work and its appreciation of American contributions.

It is expected that next year the Society will be able to obtain larger quarters for its exhibition, which they have been unable to do during and since the war.

Lubschez Photographs

An exhibition of photographs was held at the City Club, New York, from October 4 to 25, consisting of thirty-eight prints, the work of Ben T. Lubschez, of New York. They were bromide enlargements, 11 x 14, and very tastefully mounted. The collection comprised landscapes, marines and architecture. The best were "Long Beach," "Hermitage—Nashville, Tenn.," "Reflections," "Toward Times Square," "Broadway Canyon," "Long Island Sound," The Street—Winter," "Potomac River," "Peaceful Waters," "San Gabriel Mission, California" and "Clouds over the River."

Acknowledgment

In "The Workroom" of the September Journal, page 363, we published an article on "Photographing Cut Flowers." This article was reprinted from *Kodakery*, and the omission to give full credit was an oversight.

Interview with Mr. Eastman

It is seldom that Mr. Geo. Eastman, of the Eastman Kodak Co., speaks for publication, and any expression from him therefore is listened to with more than common interest. In *System* for October is a lengthy interview with Mr. Eastman, which gives us an insight into his long career in organizing and building up the wonderful and useful company which bears his name. This article will be of special interest to all our readers.

Pittsburgh Section Professional Photographers

A delightful meeting was held by Pittsburgh Section, No. 2, Professional Photographers, at the Della B. Hayes Studio, Butler, Pa., on the afternoon and evening of September 28. A special car was chartered from Pittsburgh to Butler and about thirty-eight persons attended.

The afternoon was spent socially, refreshments being served by Miss Hayes. The business meeting was unusually interesting, Mr. Diehl making an excellent talk on the Better Business Convention at Milwaukee and emphasizing the worth of coöperative advertising.

Dinner was served in the evening at the Y. W. C. A., after which the special car returned to Pittsburgh.

Thomas M. Jarrett,
Secretary.

To Coat Drawing-paper for sensitizing use arrowroot. Take 90 grains of Bermuda arrowroot and 7 ounces of water. Rub the arrowroot to a cream with a little of the water, then add the rest boiling hot, stirring until the solution is clear. If it does not clear, cook it two or three minutes; When cold add ammonium chloride, 60 grains. sodium carbonate, 100 grains; citric acid, 30 grains; water, 2½ ounces. Heat the mixture and filter. While it is still warm immerse the paper in the solution, drain it and let it get nearly dry, then dip again and dry. The coating makes a foundation for any sort of sensitizing solution.

When you are doing a lot of business advertise to get some more. When you are doing no business advertise more to get some.

Everyone in your district doesn't see your show-case.

The WORKROOM

CONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

The Reconstruction of Negatives and Prints
The Perfect Developer
Silver Intensification
Making Solutions
Defects in Negatives
Variations in Hypo-alum Toning
Facts and Figures from a Note Book
Making the Best of Surplus Stale Dry-plates
Enlarging Methods
Toning Gaslight Prints with Uranium and Sulphur
Telephoto Lenses for Professional Work
The Hand-Camera in Professional Photography
Dry Collodion Emulsion
Photographic Materials and Processes

THE WORKROOM

By the Head Operator

The Reconstruction of Negatives and Prints

THERE are two chemical methods of altering the scale of gradation in a print in the initial stage of reconstructing the negative, *i. e.*, by manipulating the exposure and by altering the composition of the developer; and as any variation from the normal process in either method has a direct and palpable effect, I beg my inexperienced readers to consider the following remarks and advice upon the subject very carefully.

If the same end can be attained by altering the composition of the developer, adopt that method in preference to varying the exposure. If you vary the exposure you at once do away with an important constant, and any faults due to such procedure cannot be effectually rectified by development.

Before you have gained some experience in the work, do not attempt to make a compound variation in exposure and development.

Never employ "time development" if you have altered one of your constants; the negative must be developed slowly and examined from time to time. Remember that the initial effect due to any alteration in the composition of the developer will be the greatest. Now, different developers have very different effects in this part of the work, and it is an absolute necessity to know the peculiarities of the one in use. As to the best one to use, I am not prepared to say, opinions are bound to differ on the question, with more or less reason; but I will maintain that where the four essential features of cleanliness in working, colorlessness of deposit, constancy for similar formula, and simplicity in modification are required, you cannot do better than employ either of those given.

I give here a formula for a single solution, of metol-hydroquinone, the modifications of which are very similar to rodinal in their effect, except that the developer is more energetic in its action. The beginner must on no account get confused or worried at the thought of modifying or altering the composition of his developer. I have repeatedly found a prevalence of this peculiarity in young workers, and regret that many writers have given very great cause for its existence by splitting hairs over the effect of slight variations in the percentage of the caustic alkalies and carbonates and other ingredients contained in the composition of some developers. In the two formulæ given no difficulty will be experienced in this direction, as one of the great advantages in their employment lies in the fact that the modifications consist only of the addition or exclusion of bromide of potassium and dilution with water.

Ten per cent. bromide to be added when necessary at time of development.

The keeping quality of the above is practically indefinite, so may be made up in the quantity given.

Bromide of potassium has been purposely omitted from the formula, as its effect can be more easily controlled when added, in known quantity of a 10 per cent. solution, from a dropping bottle.

METOL HYDROQUINONE

Metol	200 gr.
Hydroquinone	120 gr.
Sodium sulphite	6 oz.
Potassium carbonate . . .	3 oz.
Water (distilled or filtered boiled)	80 oz.

The general effects to be obtained by the various methods of altering the original scale of gradation in the copy are as follows:

CASE I.—*Copy too flat or soft, too full of detail and lack of mass.*

Curtailing exposure with normal development will harden the result generally by loss of detail and lighting in the shadows. By the initial addition of bromide to developer the high-lights are still further kept back, providing development is stopped before it has reached the extreme limit, thereby increasing contrast still more. By diluting developer and omitting bromide the contrast in the original may be nearly preserved, detail only being lost.

Exposure normal or correct. By the initial addition of bromide to normal developer the contrast is increased universally, providing development is stopped before it has reached its extreme limit.

By diluting normal developer, and adding bromide, a thinner negative is obtained, but with almost precisely the same ratio of contrast as above. Such a negative is suitable for enlarging purposes.

Note. In order that my readers may clearly understand what is meant by the limit of development, it must be remembered that development is complete when no further reduction of the light-affected bromide of silver in the emulsion can be effected by ordinary development; beyond this point, any further apparent reduction is simply chemical fog or decomposition, due to prolonged immersion in a comparatively strong solution of developer. It should also be remembered that if a developing solution of however large a volume be sufficiently weak in the percentage of the reducing or developing agent, immersion of the negative for twenty-four hours or more will in all probability completely develop it without any tendency to decomposition. Such a solution is generally known as a "stand developer." This proceeding, however, is not permissible with all developers.

Case II.—*Copy is too hard or full of contrast.* By increasing exposure and using normal developer the steepness of the scale of gradation is lowered, and the whole softened by reducing the contrast between the high-lights and shadows.

Exposure Normal. By diluting normal developer a thinner negative is obtained with practically the same contrast, providing development be stopped before the limit. By using a normal developer and omitting bromide a softer result is obtained.

By diluting normal developer and omitting bromide a much softer and thinner negative is obtained.

There is another method, which, I believe, is not generally known, by which contrast in the copy may be reduced, and which lends itself to a considerable possibility of local treatment: If a piece of card, with a dead-white surface, be frequently passed in front of the copy during exposure, a general softening is the result; but it must be remembered that the card must not be passed backward and forward, or the middle of the copy will receive less exposure than the rest, unless the card clears it each time. Do not attempt to obtain a reverse rendering by using a black card; it has not the desired effect.

The worker must always bear in mind the printing process he is going to employ, and develop to produce the degree of density most suitable to that process. Should he afterward decide to print by a different process, the negative may often be accommodated to it by the interposition of pale yellow glass for increasing contrast and pale blue glass for reducing contrast.

The possibility of reconstructing a negative is in itself worth all the time spent on mastering the process. A method of reconstructing a negative in which there has been a movement of the subject—a sitter in a portrait for instance—may be often employed with advantage and success; it is as follows:

The negative is bleached in mercury, and, as in nine cases out of ten, one position has received much more exposure than the other, this will consequently give the stronger positive image. The film is now backed with black velvet, or similar medium, and the positive image copied through the glass; by this means we obtain another negative the correct way round; that is to say, that when printed from in the ordinary way the prints will show the subject in the same position as if printed from the original negative. Professional photographers should remember this if they do not already know it.

The Perfect Developer

Every photographer discovers the "perfect developer" at some period in his career—a developer which will do more than anything else to correct errors in exposure, and bring out all the qualities needed for the ideal print. Each new discovery of the chemist, providing it is properly advertised, has its period of enthusiastic popularity. "Have you tried it?" says the latest convert to his friends. "I can assure you it is wonderful. I never got such negatives before. Really, all the results on my last holidays are marvellous." Then after a time comes reaction. Somehow, on another journey, the plates developed with the perfect developer leave much to be desired, while those taken by a companion on the same trip were excellent. Gradually it is forced upon the enthusiast that the developer was not at fault, and that his "perfect developer" was only perfect when the correct exposure had been given. We all go through this experience, and one so necessary to us if we are to realize that the perfect developer is the one which we understand the best.

In our case the perfect developer for negative making is "Pyro." We have had our youthful enthusiasms for the "ens" and "ones" and "ols," and return to the oldest of them, "pyrogallol." Despite the valuable discoveries of the photographic chemist, we imagine "pyro" is as secure in its position as ever it was, and probably larger quantities are used today than ever before, although we quite appreciate the advantages of some of its newer rivals for special purposes. And the causes for the popularity of "pyro" with the majority of the best workers are its cheapness, its admirable keeping qualities both in crystal and in solution, and its suitability for making concentrated solutions, of which only a few drops are required for developing a plate. Regarding its cheapness, price is a small matter, and does not stand in the way when perfection of result is desired. Fortunately, with pyrogallic acid, cheapness is not secured at the expense of quality, for the crystallized "pyro," which is sold in small bottles, is in our opinion, not only cheaper but better than the old style in beautiful snow-flake form. The crystals not only economize space, but seem to make clearer solutions, probably because they keep better. Then the immense advantage of "pyro" so far as concentration of solutions is concerned is at once manifest. From 2 to 4 grains of "pyro" are sufficient to develop a quarter-plate and 1 ounce (437½ grains) quickly made up into solution will last most amateurs a considerable time. The formula we recommend for all-round work is as follows:

No. 1 Stock Solution

(label "Pyro 10 per cent.")

Pyrogallic acid	1 oz.
Potass. metabisulphite . . .	1 oz.
Water to	10 oz.

No. 2 Solution

(label "Soda 20 per cent.")

Soda carbonate	4 oz.
Soda sulphite	4 oz.
Water to	20 oz.

A simple plan is to get 10-ounce and 20-ounce bottles, and use them for the purpose of the developer. The quantities given are not quite correct scientifically, but they are practically, which is the main thing. An extra bottle may be had containing:

Potassium bromide	1 oz.
Water to	10 oz.

but bromide is rarely necessary with good plates.

To develop, we usually take 1½ ounces of water, add from 40 to 80 minims of 10 per cent. "pyro" solution, and make up to 2 ounces with 20 per cent. soda solution. We say from 40 to 80 minims of "pyro" solution because some plates will not require more than 40, while others will usually want 80 if a strong and brilliant negative is required. Temperature is important, so far as time of development is concerned, and a temperature of about 65° F. is advisable. In very hot weather, or with plates prone to fog, from 10 to 20 minims of bromide, 10 per cent. may be added to the 2 ounces of mixed developer. The time of development must, to a great extent, be left to the worker, and is "according to taste." In such a developer as we have described for bromide printing or enlarging, three to four minutes would be ample, but denser negatives made for platinotype printing should have about eight minutes.

Silver Intensification

THE ideal method of strengthening a developed silver image would seem to be by the deposition of metallic silver upon it from a solution of silver salt, much in the same way as a wet negative on a wet collodion plate is intensified. As many of us know, the silver intensification of a wet plate is about as perfect a process as any we have in photographic chemistry; but since the introduction of gelatin as the vehicle in place of collodion, silver has not been much employed as an intensifier.

I do not intend to enter into the various methods of intensification that have been advocated since the early days of the gelatin dry plate. There have been very many, most of them containing mercury in some form or other, and of the vast multitude probably the best and most scientific is that one advocated by Mr. Chapman Jones, in which, after bleaching with mercury, the plate is darkened in a ferrous oxalate developer. It is my province this evening to deal with the building up of the image by the deposition of silver upon it, the method being that given in my original formula, containing sulphocyanide and hypo.

One of the most admirable qualities of this method is that it retains the same ratio of gradation which existed in the original negative. In certain cases, where it is necessary to obtain very great contrast, it may be found useful to employ one of the other methods, though I hope, later on, to show that even with the silver intensifier it is possible to alter the ratio of gradation, when it seems necessary to do so.

Although the silver intensifier with sulphocyanide and hypo has been published for some twenty years, and has proved satisfactory in the hands of a few, for one reason or another it has never taken a strong footing among the many. There are one or two reasons for this. In the first place, it was found that the action of the sulphocyanide so softened the gelatin that with some plates it actually dissolved the film. Then again, staining took place so badly with it at times that when intensification was carried to an extreme limit, so intense was the dichroic fog produced that its red stain in the clear portions was even more intense than the deposited silver.

If these faults could not be remedied, so that the process could be worked with certainty, it was of no value for everyday use.

It is a curious fact, that with some emulsions there is no trouble from staining. Whatever the reason, we know so little of the complications that occur between the organic developer, the silver, and the gelatin, that it would be futile on my part to discuss the theory of it.

I may say, however, that I have noticed that with some formulæ for emulsion making, used under certain conditions, green fog is liable to be produced if pyro and ammonia is employed for development; and that the same thing occurs with my silver intensifier, with pyro and ammonia or even if other alkalies are used in place of the ammonia. This points to the fact that there is some compound formed between the silver and gelatin.

Mr. Blake Smith two years ago published various formulæ for the clean working of silver intensification, as well as for getting rid of what he called "resin stain" of the developer. These methods were admirable in their way, from a chemical point of view, but the many manipulations required quite put it outside everyday use.

I felt so convinced that the sulphocyanide of silver intensifier was capable of good results that I determined to try to make it practically usable under all conditions; and I hope to prove to you this evening that I have done so. The whole secret lies in a nutshell. We must first attack the invisible compound of silver and gelatin which causes the stains. There are several reagents capable of doing this; copper chloride, potassium ferricyanide, acid bichromate being among the most successful I have tried, the latter being perhaps the most reliable of all, an immersion of the negative to be intensified for one minute in a very weak solution, followed by a two or three minutes' washing before it is placed in the silver solution, being quite sufficient to prevent all signs of staining.

The practical details are as follows: In the first place, it is very necessary to harden the film. A bath of formaline is, therefore, used, so that the plate will withstand the softening action of the sulphocyanide. A soaking in a bath of one part of formaline to ten parts of water, for five minutes, is sufficient. This bath may be kept as a stock solution, and used over and over again. After a few minutes' rinsing, the negative is placed in either of the following for exactly one minute, the bichromate being recommended by preference:

Potassium ferricyanide . .	20 gr.
Potassium bromide . . .	20 gr.
Water	20 oz.

or

Potassium bichromate . .	1 gr.
Potassium bromide . . .	20 gr.
Hydrochloric acid	60 min.
Water	20 oz.

Too long an immersion in either of these baths causes the image to bleach, which we wish to avoid, if we desire to retain the original gradation. In the time prescribed, there is little apparent change; but the reducing agent has done its work, and after a few minutes' rinsing the negative is ready for the intensifying solution.

The intensifier may be kept in the form of two stock solutions, which will keep good for years.

A

Silver nitrate	800 gr.
Water (distilled) up to	20 oz.

B

Potassium sulphocyanide	1400 gr.
Sodium hyposulphite	1400 gr.
Water up to	20 oz.

Half an ounce of B is taken, and to it is added half an ounce of A, stirring vigorously with a glass rod. The result should be a clear solution; if the stirring is omitted it is liable to be turbid. To this is added 1 dram of a 10 per cent. solution of pyro preserved with sulphite, and 2 drams of 10 per cent, ammonia. The negative is laid in a chemically clean dish, and the silver solution poured over it. The deposition of the silver begins to take place in a minute or two, and the image gradually gains in strength. As soon as sufficient density is acquired, the negative is placed in an acid fixing-bath, until the slight pyro stain is removed, and is then well washed, as usual. It is well to rub the surface of the film with a tuft of absorbent cotton at some time during the washing, to remove a slight surface deposit which will be found upon it.

There is one thing upon which I must lay stress and that is that the negative to be intensified must have been thoroughly fixed in a clean, fresh, hypo bath, and not merely have been left for some indefinite period in a stale or dirty solution of hypo that has been used on other occasions. This is important, but is a point on which I am afraid a good many photographers are liable to be careless.

So far, the process, as described, does not alter the density ratios, merely increasing the vigor of the image proportionally right through. If, however, the original negative is flat from overexposure, we may get greater contrast by carrying the intensification rather far, and then reducing with the ferricyanide and hypo reducer. Or we may allow the negative to remain in the clearing bath for a considerably longer time, until a decided bleaching action is visible. This bleached image is partially soluble in the silver solution, and so a portion will be dissolved, while the alkaline pyro will reduce the remainder. This treatment is on the whole not really satisfactory; so that I prefer to treat the intensified image, which by the way, should be a trifle overdone, with the Howard Farmer reducer, as just described.

In a similar way we have it in our power to make a hard negative flatter or softer, by employing ammonium persulphate, this salt (in contradistinction to the ferricyanide) attacking the denser deposit first.

I need not point out the obvious advantage of being able to watch the growth in the density of the image, and to be able to stop it at the desired moment, which we have in this method. Moreover, the result is permanent.

It is not an everyday occurrence that a negative requires strengthening, but when the necessity does occur in the stock solutions at hand, it is only the matter of a very few minutes to remedy it, and the work may be done on the lines I have indicated, with the certainty that the solutions used have not deteriorated, and that the work can be done without any risk of a hitch, or of failure from staining, or from any cause whatever.

Making Solutions

Some of the operations that many of us perform almost instinctively prove troublesome to those who do not know how to set about them. The novice may know that he requires a solution containing a certain amount of the solid in a definite bulk, and may know exactly what these quantities are, but his difficulty is to dissolve the quantity of solid so that the final solution shall be of the required bulk. A method that serves well in one case may prove very awkward in another. The simplest method is to measure into the bottle that is to contain the solution the exact amount of water that the quantity of the solution is to occupy. Ordinary Winchester quarts, for example, hold rather more than 80 ounces, or 4 pints; or, for those who use the metric system, two liters is a convenient bulk of solution to prepare in such a bottle. For smaller quantities a quart, pint, liter, etc., smaller bottle will be chosen, but each will have marked on it by a label, a scratch with a diamond, or a line made with a small brush dipped into Brunswick black, the position of the top of the liquid when the required quantity has been put into it.

To prepare, for example, a plain solution of hypo containing 4 ounces to the pint, 4 ounces of the solid are put into the bottle marked at 1 pint, or 16 ounces into the four-pint bottle; water is added until it comes nearly up to the mark, and the bottle is shaken until the whole of the solid has dissolved. Or a shake may be given now and then as convenient, until the solution is complete. Water is then added to bring the bulk exactly up to the mark, a final shake is given, and the required solution is obtained.

If the weight of the solid is to be dissolved in the given bulk of water, the water is measured first, the solid substance is added, and the mixture is shaken until the solution is complete. If the solid substance is contained in a sealed tube, such as the gold and platinum salts are often sold in, the water may be measured first, and the tube, after carefully cleaning it outside, may be cut open and dropped bodily into the water. The bulk of the solid salt in such cases is so small as to be negligible.

If it is found that this method is too slow it may be quickened in various ways. The solid may be ground more finely (in a mortar) before it is put into the bottle. This applies especially to such substances as hypo, crystallized sodium carbonate, sodium sulphite, etc.

To hasten the solution the water may be warmed. It it is desired to warm it to a higher temperature than the back of the hand can bear, it would not be safe to put the warm water into the bottle. A glass flask, such as is sold by chemical apparatus dealers, should then be used, and it should be heated over either a Bunsen gas-burner or a spirit-lamp. But this method is not advisable for those who have had no experience in the use of chemical apparatus; they should be content with the slower and quite sufficient method of shaking in the bottle with cold or slightly warmed water.

Saturated solutions being those that contain as much of the solid as the water will take up, the shaking method is tedious, even if the substance is finely ground. The unground crystals should be tied up in a piece of muslin, the string tied to the middle of a pinstick, meat skewer, or something of the kind, and the stick placed across the mouth of a wide-necked bottle or suitable jar, so that the substance to be dissolved hangs in the upper part of the water. Solution will then go on automatically until either the solid is all dissolved or the water has dissolved as much of it as it can. The solution as produced sinks in the water, and the circulation is thus kept up to the end without attention.

The solutions of those substances that are dissolved in small proportions, as for toning baths, may be prepared by the simple shaking method, but if the crystals are rather large, such as sodium acetate, they may be crushed first. Potassium bromide, ammonium bromide, sodium carbonate, potassium carbonate, as generally used for development, or for 10 per cent. solutions, and caustic soda for any strength of solution, may be dissolved by simply shaking them up in a bottle as described. Saturated solutions of potassium oxalate (for platinum printing), mercuric chloride, alum, etc., are best prepared by the muslin-bag method. To these may be added solutions of hypo for fixing, though the simple shaking method is not very tedious in this case. A solution of crystallized sodium sulphite of 50 per cent. strength can only be prepared conveniently by heating the water in a glass flask, but a 25 per cent. of weaker solution may be prepared by either of the other methods.

It is desirable to filter all solutions before use, unless they can be allowed to stand long enough to become clear.

Iron sulphate, ammonium carbonate, and potassium metabisulphite should each be dissolved in cold water.

Solutions containing pyrogallol, amidol, and other active developing agents should not be filtered. The preservative, metabisulphite or sodium sulphite, and the acid, if any, should be dissolved before the pyro.

Distilled water should always be employed in making up solutions that are to be kept any length of time.

Potassium ferricyanide can be kept in solution, but it is better not to do so.

Solutions of the caustic alkalies, and of sodium or potassium carbonate, are better kept in corked than in stoppered bottles. They have a great tendency to make stoppers stick.

Defects in Negatives

A PERFECT negative presupposes a perfect plate, correct exposure, and correct development stopped at exactly the right time. It is almost unnecessary to say that all these conditions are rarely satisfied, and consequently most negatives fall more or less short of perfection. The defects may be broadly grouped under two heads, namely, those due to imperfections existing in the film before exposure, and those due to defects or errors in the way in which the plate has been treated. It will be more convenient to deal with the latter, and larger, group first, but there is really no hard and fast division between them.

The negative is thin, or in other words, while showing good gradation, and sufficient relative contrast between the different parts, is as a whole lacking in opacity or printing strength, and gives prints that are deficient in vigor and contrasts. The plate has been removed from the developer too soon, and the remedy is to intensify the image. Sometimes the want of opacity is due to the fact that the developer was too cold.

The negative is too dense or opaque and consequently, although showing good contrasts and gradations, takes a long time to print, especially on dull days. The developer has been too energetic, or development has been continued too long; the remedy is to reduce the image.

The image is "flat," or shows comparatively little contrast between the highest lights and the deepest shadows. This may, of course, be due to the absence of contrasts in the subject photographed; it is commonly due to overexposure; it may be caused by using a developer containing too little reducer, or restrainer, or both, and too much alkali; sometimes it arises from a defect in the quality of the emulsion, or from the fact that the plate has been coated with an abnormally thin film of emulsion.

The image is "hard," or shows excessive contrasts between lights and shadows, and is defective in the range of its half-tones. This is probably due to underexposure, but may have been aggravated by the use of a developer containing too much bromide or too little alkali. Local reduction may partially remedy the defect.

Fog. A more or less marked gray deposit of reduced silver extends over the whole surface of the image. It may be due to overexposure, in which case the edges of the plate that have been protected by the rebate of the dark slide usually remain clear. It may also be caused by using a developer containing too much alkali, or too little restrainer, or both, or by the plate having been exposed to actinic light outside the camera, including the light from the dark-room lamp if the glass or colored fabric used as the screening material is not efficient. In any of these cases the defect would be observable up to the extreme edges of the film.

The character of the dark-room light should be tested by exposing one-half of a plate to it at a distance of say nine or twelve inches for five or ten minutes, the other half of the plate being protected by some opaque substance. The best plan is to put the plate into a dark slide and draw out the shutter half-way. After exposure the plate is treated with a developer in the usual manner, and it can then be seen whether or no the light has exerted any action on the plate.

Slight general fog may, as a rule, be neglected, but if the amount of fog is at all considerable the plate should be treated with a reducer, and afterward the image can, if necessary, be intensified.

Green Fog. The surface of the film shows a peculiar brilliant green or yellowish-green lustrous appearance, generally in patches, when examined by reflected light, but is more or less distinctly pink when the plate is looked through. This effect is rarely observed except when pyro-ammonia has been used as the developer, and it most frequently occurs with old plates, especially if development has been long continued or has been forced by the addition of comparatively large quantities of ammonia.

If the green fog is only slight it does not affect the prints made from the negative, but in bad cases the prints have a patchy appearance and are less deeply printed at those points where the green fog is worst.

Two methods are available for the removal of green fog:

In one of these the plate, after being fixed and washed, is placed in a hypo solution of half the strength of the ordinary fixing-bath, and to this hypo solution is added a very small quantity of a solution of potassium ferricyanide, and the mixture is allowed to act on the plate for some time, the dish being rocked occasionally. The green fog will gradually disappear, and some more of the ferricyanide may be added, if necessary, to secure this end; but it is important to keep the proportion of ferricyanide as low as possible, otherwise the image itself will be reduced. For this reason, if it is seen or suspected that the green fog is likely to be bad, development should be carried a little farther than usual in order to allow for the slight reduction that accompanies the removal of the green fog.

The other plan is to immerse the plate in a dilute solution of ferric chloride (perchloride of iron) until the green fog has been completely bleached, then wash, first in a dilute solution of oxalic acid and afterward in water, and finally treat with a developer, preferably ferrous oxalate. The green fog is converted into a very fine gray deposit which is almost invisible and has no appreciable effect on the printing qualities of the negative.

Black spots may be due to particles of dirt that have been allowed to lodge on the film during one or other of the operations, or during drying. They may also be due to particles in the emulsion, and in the latter case are generally round and sharply defined.

Black marks of the nature of irregular streaks, looking, so to speak, like black scratches, are generally due to mechanical abrasion of the film. Pressure produces a developable image similar to that produced by the action of light.

Transparent bands, or bands showing less opacity than the rest of the image, are sometimes caused by exhalations from the material forming the hinges of the dark slides.

Transparent spots if small ("pinholes"), are generally due to the presence of particles of dust on the surface of the plate when it was exposed. Prevention lies, of course, in carefully dusting the plate and the dark slide with a soft, clean, dry camel's-hair brush, before putting the former into the latter. If the spots are larger and circular, they are due either to the formation of air-bubbles on the surface of the plate during development, or to the presence in the film of insensitive particles.

Uneven opacity or density, varying gradually from one end or side of the plate to the opposite end or side, is due to uneven coating of the plate. If there is a distinctly defined patch, less opaque than the rest, the plate was not properly covered by the developing solution.

Stains. A uniform stain, of a yellowish or brown color, is produced when the pyro developer contains too small a proportion of sulphite or is allowed to act for a very long time. Such a stain is rarely observed with the other developers mentioned above. The pyro stain can be more or less completely removed by immersing the plate for some time, with repeated rocking, in the alum solution given above, 1 dram of sulphuric acid being added to every 10 ounces. The plate must afterward be well washed in soft water. Similar stains in patches may be caused by using dirty dishes or a developer that has become turbid by being frequently used.

Deep yellow-orange or brown stains, appearing gradually in patches or all over the negative, some time after it has been fixed and washed and dried, are due either to imperfect fixing or to incomplete washing after fixing. There is no practicable remedy.

Halation. When the subject photographed includes some part much more brightly lighted than the rest, such as a window in an anterior subject, the details of the bright part are not only lost, but the image of it seems to spread in all directions, obliterating the details of the surrounding portions. The effect is especially noticeable when the subject includes dark parts which necessitate a somewhat long exposure. A window at the end of a long, dimly lighted interior, or dark trees against a bright sky, are cases in point. The effect is really due to the fact that the sensitive film is not perfectly opaque, and some of the incident light passes through the film and is reflected from the back surface of the glass on to the under side of the film, producing a blurred image superposed, as it were, on the normal image formed at the surface of the film by the action of the direct light. The effect is known as "halation." It is prevented by having a perfectly opaque film, which is a condition difficult to realize in practice, and which, moreover, introduces certain other disadvantages. It is also prevented by coating the back of the plate with some substance that will absorb the rays that have passed through the film, and so prevent their being reflected back against the under side of the film. The substance used must either be opaque or must have a deep orange, brown or red color, and it must have the same refractive index as the glass, otherwise the reflection will not be prevented. For practical convenience it must also be easily applied and easily removed. Many substances have been recommended but nothing is so good as caramel, prepared by the action of heat on sugar. In order to get the mixture to dry completely after it has been applied, a somewhat troublesome process of purification is necessary, but caramel specially prepared for the purpose can now be obtained from dealers in photographic materials. The caramel (which is a solid substance) is dissolved in just enough water to make a thick syrup, which is carefully applied to the back of the plates in a thin layer by means of a flat brush.

If the caramel does not dry properly the solution may be thoroughly mixed with about one-quarter (or more) of its weight of very finely powdered burnt sienna or burnt umber, "ground in water."

After being coated, the plates require some time to dry, and must of course, be carefully protected from light. If the dark-room is thoroughly dark, the plates may be put up to dry in the same manner as negatives, but if the dark-room is not suitable, some sort of drying box must be used.

After exposure and before development the backing is removed with a damp sponge; if caramel only is used in a form completely soluble in water, it need not be removed unless a developer is being used that is to be applied to several plates in succession.

Variations in Hypo-alum Toning

It should be understood that, in discussing the manipulation of developing-out papers and their subsequent toning, I have reference only to the professional or portrait grades used in the making of portraiture. The extreme variations of latitude and developing speeds of the more contrasty papers mostly used for purposes other than that of making portraits would prevent one who did not use them continually from arriving at definite conclusions as to their proper manipulation for sepias of a predetermined tone.

The popularity of sepia tones for portraits seems unquestioned. The warmth and richness of tone in well-made sepia photographs seem undoubtedly to be the cause of their almost universal popularity. If, then, the desirability of sepia tones is acknowledged, their production should be facilitated, especially among those who have not been getting satisfactory results; and this can easily be done, providing the explanation of a satisfactory working method be obtained. I make no attempt to pose as an authority upon the exact chemical reactions of various formulæ, but can definitely state that, with each variation from what may be considered a standard formula, a certain difference of tone will result in prints which were exposed and developed identically alike. This knowledge should, as we progress, be considered as the basis for control of tone. There are undoubtedly difficulties in their making over that of a black and white print, as witness the fact that a satisfactory black and white print will not always tone to a good sepia; but that should prove to be no hindrance, if the underlying causes are but understood.

I have seen photographs that were of a pronounced purple tone, others ranging in tones through the different shades of brown until they approached the very undesirable yellow; yet they were called sepia photographs. This, of course, absolutely conflicts with the dictionary definition of sepia, and actually is only the attaching of a fixed title to whatever result is haphazardly produced. Unless one decides in advance what color is really to be obtained and knows how to obtain it, I do not see a possibility of any but an accidental result.

Another grievous fault found in the work of many seems to be a lack of detail and a bleached appearance in the high-lights, due to insufficient length of development brought about, no doubt, by a desire to avoid a cold or purple tone, which would ordinarily be obtained by too long development. The experienced printer should know that, in the development of all portrait papers of quality, the exposure should be so judged that, when being developed, the image will leisurely proceed to a point where it seems to hesitate. From then on, for perhaps the following thirty seconds, it will be found to take on an added richness in general tone without appreciable darkening, and that the little points of high-lights will then show visible detail, giving a sparkle to the print as a whole, which is lacked previously. Until then development is not completed, and my purpose is to show that, from such a print only, can the best finished result be made.

The proper length of development in a normally balanced developing solution should be not less than sixty seconds and not more than one hundred and twenty seconds for papers of various speeds.

I shall divide developing papers into two classes: one, such as Professional Cyko, having a natural tendency for giving prints of a blue black tone, as against Artura Iris, which produces normally more of an olive tone with equal amounts of bromide used. When using any portrait paper which produces ordinarily the former tone, an increase of potassium bromide over a normal amount is advisable; even double the quantity will not be found excessive.

When using the papers which naturally produce the more olive tones, any excess of bromide would be detrimental, in that it would increase the tendency of the resulting sepia to being yellow in tone. It will be found best to work with one kind or the other, according to one's preference, at any one time, as they are toned in hypo alum baths of different composition.

For purposes of experimentation, let us make six prints from one negative; first, three prints from a paper such as Artura Iris, Haloid Imperia, or other olive-toned papers, using a minimum amount of bromide, developing as previously explained. Then three prints from a paper giving a cold black and white tone, such as Cyko, Artura Aegis, or Haloid Cameo, as preferred, using a maximum amount of bromide. Take care that each print shall be as nearly identical as possible on like papers. After these are fixed it is advisable to wash just long enough to rinse away any acid remaining in the print from the fixing-bath, when they are ready to tone. The use of too strong a hypo bath for fixing the prints should be avoided. One that will test about 60 per cent. by hydrometer is about correct, also having included in it the ordinary amount of acid hardener for prevention of blisters. A hypo bath stronger than this may have a tendency to cut or bleach the image to a certain extent, which would result in giving a very pale or weak-appearing sepia.

A normal toning bath should be made as follows, preferably some time previous, as it will be found to work better if having been given the opportunity to cool, then re-heating it for use:

One hundred ounces of water, in which dissolve 1 pound of hypo. Then add 4 ounces of powdered alum, and heat to the boiling point. As soon as it has boiled a few minutes, set it aside to cool. Dissolve in 1 ounce of water, 30 grains of nitrate of silver. Precipitate the silver with about 30 drops of pure ammonia, or, if more convenient, use 30 grains of common salt. Then add the contents to the alum bath after it has cooled.

To use the bath, heat it again to about 130° F. The bath should have a milky appearance, and should not be dark in color. If this should be so, the silver nitrate was not properly precipitated before adding it to the first solution.

For proof of ability to control tones as wanted, let us now tone two prints previously made as directed, using one each of the papers having different characteristics. Toning at 120° to 140° F. should be complete, in ten to fifteen minutes. Upon examination, the two sepias will be found unlike. The print which was the more olive originally will be the warmer brown, or of a more yellow tone.

For further experiments, divide the alum bath into two 50-ounce solutions. To one add 10 grains of silver nitrate and also 1 ounce of gold chloride solution, which is made as follows: Dissolve 45 grains of chloride of gold in 16 ounces of water to be used as a gold stock solution. To the other bath add 10 grains of iodide of potassium, dissolve in a very little water. In these two baths when heated, two each of the remaining prints should be toned. Then all six prints should be compared. No two prints will be found exactly alike in tone. The ones which were toned in the gold bath with an increased amount of silver, will be found to have a more chocolate or purple tone than the first two that were toned, although one should be more so than the other. The ones that were toned in the bath having iodide added should be a much warmer tone than any of the others, but one should be more of a yellow tone than the other.

By the addition of silver or gold to a bath when colder tones are wanted, and by the addition of potassium iodide to keep the tones as warm or light as wanted, it is possible to produce in your work your own conception of what sepias should be, not having to accept even if unsatisfactory, the tone which may happen to be produced. A tendency of the bath to give gradually colder tones from continual use will be noticed, which may be corrected by the addition of from 5 to 10 grains or iodide whenever needed. In addition, the knowledge may be made use of that, to a certain extent, a print may be so exposed as to render it necessary to slightly prolong development beyond a strictly normal length of time, being careful not to overdo it, which will give proportionately colder tones in any alum bath. By working in the opposite manner and so timing the exposure that development is complete at the expiration of the minimum time, the tones will be correspondingly warmer in any bath.

With this knowledge gained, and a decision formed as to which particular print is preferred, it is only necessary to use the paper which gave that result in the particular alum bath which was used. A larger quantity of one bath may then be made for regular use by keeping the different chemicals proportionately the same. The bath will evaporate somewhat from continual heating. Renew the volume with additions from a separate solution of the same formula of hypo and alum only, using the gold, silver, or iodide as the means of controlling the tones. The papers answering the purpose best, perhaps, are the ones which give a rather undesirable cold black and white toned print; but, if used with enough bromide, and not forcing the development through under-timing of the print, will yield the most pleasing browns.

The use of either a buff or white color stock paper base is, of course, for individual preference to decide, but I do not feel that, for white draperies, or where the predominant tone of the clothes is white, a buff stock should be used. If a lady wears a white dress, I feel as though her taste should be respected, and that it is undoubtedly because she does not prefer a yellow one. On the other hand, for certain effects, a buff paper will often seem to add a certain richness to the whole effect which is very pleasing. The papers having a slight sheen or semi-sheen will be found to tone a more brilliant brown, and will remain nearly the same after being dried.

The matt or rough surface papers will normally tone to a less brilliant color, and will show a considerable dulling down in color after being dry. With experience, it will be perfectly possible to make allowance in your original print for this slight change of color, by making the matt surface prints a trifle lighter than those on semi-gloss papers.

I would also advise their being exposed so as to develop in the minimum time, using in the alum bath enough iodide to prevent the resulting browns from being too chocolate in color.

There seems to be a predominant impression that in order to make successful sepias, it becomes necessary to make a hard or rather contrasty negative. This, happily, is not a fact, as, were it so, it would then be necessary for the better workers purposely to make negatives of sharp gradations, minus the very qualities of remodelling which are essential to work of quality, for the secondary purpose of conforming to requirements considered necessary to produce a given style of work.

This idea no doubt originated from the fact that a certain amount of contrast has been found to give the richest appearing brown tones. The proper solution of this difficulty seems to be in so lighting the subject as to make the best possible negative, being careful to have the necessary contrast between your subject and background. By so doing it will be seen that the proper scale of gradations in the lighting is retained, and that no detail present in the highest points of light need be sacrificed. The use of too light a background for most sepia work will result in a pale brown color which will be very undesirable, and not at all pleasing.

The fact that sepias are not so easily made as a plain, untoned print, seems as though it were an advantage as well as protection for those who wish to produce portraiture with a certain touch of individuality, which may not be so easily duplicated by others.

Continuously producing rich appearing sepia toned portraits of a uniform shade will surely attract the attention to you of that clientele for whom the more desirable work may be done, with its resultant sense of satisfaction and proportionately larger profit to you.

In concluding this very technical talk on mechanical manipulations. I wish to depart from my subject proper and say that, though all the different mechanical processes should be thoroughly mastered, they should be considered but incidental to the result being sought.

I feel that a purely mechanical photographic reproduction is just a photograph, and that it lacks the qualities necessary to its being termed a portrait.

It is possible to idealize each individual in one's own mind according to one's ability to do so, trying to avoid being impressed by the objectionable, subordinating those things in importance, being mentally quickly responsive to the pleasing characteristics of each person. I believe it possible then to visualize mentally a picture which can be reproduced photographically as a characteristic portrait of any individual, yet a thoroughly pleasing one as well. Many technical errors will be overlooked by the public, through their not being understood, if your portrait work has that quality of appealing to them through its being pleasing to the sight.

Whether it may be the play of light and shade, the animation of the eyes, the brightness of expression, or the balance of the composition, the constant striving for only that which is pleasing to you will lift your work above the purely mechanical into the class of those who make portraiture, not purely for mercenary gain, but because it offers opportunity for the expression of self in the form of idealism, to the end that others may also be helped to become more conscious of the fact that the beautiful is all about us, and needs but be looked for with receptive eyes.—*Camera Craft.*

Facts and Figures from a Note Book

Being an inveterate note maker, I find that I have collected a number of facts and figures relating to photography. They are much too disconnected to form an article, but I think they will be found of general interest in spite of this. I can claim no originality for them, but since they have been collected in a very wide reading of photographic books and papers, it is likely that some will be new to everyone. To the original publishers I tender my thanks, as every item has proved itself of value to me in some way. I have made no attempt to classify them:

To convert a percentage figure into ounces per pint divide by 5—*i. e.*, 25 per cent. solution is 5 oz. per pint. A 10 per cent. solution contains 44 grains per ounce or liquid.

The whitest white card obtainable reflects about 30 times as much light as the blackest black card.

To show up the grain on white wood, as in photographing furniture, rub over with benzine, 1 part; kerosene, 1 part. This will evaporate.

To make matt varnish, add tartaric acid to ordinary negative varnish to saturation.

When copying on an enlarged scale, the lens need only cover the original—*e. g.*, to copy a half-plate print to fill a whole plate a half-plate lens will suffice.

To fireproof calico for flash-lamp curtains, etc., soak in solution of tungstate of soda, or, less effective, common alum.

To fireproof muslin, use:

Boric acid	5 parts.
Sal ammoniac	15 parts.
Potass. feldspar	5 parts.
Gelatin	1½ parts.
Starch paste	50 parts.
Water	100 parts.

Apply to the dry muslin with a brush.

To remove bad stains from negatives, mix:

Bleaching powder	1 oz.
Soda carbonate	1½ oz.
Water	6 oz.

Allow to settle, and pour off clear liquid for use. Dilute to half strength. Use with care, as it will soften film. When acidified with oxalic acid this is even more powerful.

To revive stale plates, soak for ten minutes in:

Chromic acid	30 gr.
Potass. bromide	60 gr.
Water	10 oz.

Wash well. When dry, plates will be clean, but slow.

To use stale bromide paper, make up:

Potass bromide	10 per cent. solution.
Potass. cyanide	10 per cent. solution.

Add 1 drop to each ounce of the developer used.

To make prints transparent, for window decoration, etc.:

Turps	6 oz. to 8 oz.
Canada balsam	1 oz.

Brush over the paper side of the print.

To destroy odor from stale fixing-baths:

Oil of cloves	10 drops.
Petrol	1 oz.

Add a few drops of this to fixing-bath.

Ammonium bromide may be used in place of potass. bromide in toning baths, but not in solutions where soda or potash is present. If it is so used, the solution will change; ammonia and soda or potass. bromide will be formed.

To make bromide prints flexible, for unmounted book illustrations, etc., soak in:

Glycerin	5 oz.
Water	25 oz.

and dry without blotting or heat.

To bore a rubber cork, moisten the borer in 10 per cent. solution of caustic soda or caustic potash.

To remove ink from negatives:

Ordinary ink.—Dilute oxalic acid solution.
Aniline ink (copying pencils, etc.).—Dilute hydrochloric acid solution.

A good general medium for coloring prints in dye or water-colors, or for spotting or Aerograph work, is:

Ox gall	20 drops.
Methylated spirit	1 oz.
Water	1 oz.

A solution for cementing film to glass is made as follows: Dissolve equal weights of gelatin and glacial acetic acid by warming and stirring. If this is too thick, use more acid.

Bromide paper may be used in an exposure meter if first soaked in either:

Saturated solution of potass metabisulphite, or
10 per cent. solution of potass nitrite.

Varnishes for film negatives:

1.	Gum dammar	1 oz.
	Benzole	10 oz.
2.	Borax	¾ oz.
	Glycerin	¾ oz.
	Shellac	1¼ oz.
	Water	20 oz.

Boil together for half an hour, add 5 ounces of methylated spirit, and filter.—ARTHUR G. WILLIS, in *B. J.*

Making the Best of Surplus Stale Dry-plates

WITH reference to stale plates in general it may here be stated that plates keep best when packed face to face, a fact many workers may have already discovered. An odd plate in a once-opened box has been found to be badly fogged, while the pairs laid film to film in the same box have been found to be fairly clear of veiling and passably good.

As regards the experiments I have made with what may be termed normal or standard developers, I have no hesitation whatever in affirming that the most unsatisfactory results have been obtained with pyro in all its guises, metol or any developer containing it, *e. g.*, MQ, and all developers without either sodium or potassium bromide, the latter salt being the true salvation of deteriorated dry plates both old and middle-aged. The very best results were those developed with Kachin, a product not now obtainable, I believe. I happened to have a little by me and some years old, but the clear result it gave was surprising. When Kachin disappeared it was rumored that it was simply pyrocatechin, and that admirers of the developer could still use it, but pyrocatechin, too, I believe, has disappeared for the time being. Kachin and pyrocatechin behave very much alike, and the factor numbers are the same, namely, 10. Glycin gave fairly good negatives, as also did plain hydroquinone and a mixture of the two.

Hydroquinone and glycin formulæ are well known, but care must be taken to employ those containing bromide and to increase the latter by about 50 per cent. As a combined glycin-hydroquinone formula may not be so well known, I may give the one I have used with success for stale plates. It is a two-solution form, namely, No. 1: Glycin, 90 gr.; hydroquinone, 30 gr.; potassium carbonate, 90 gr.; soda sulphite crystals, ¾ oz.; potassium bromide, 15 gr.; water to 10 oz. No. 2: Potassium carbonate, 1 oz.; water to 10 oz. Use equal parts of each. The above developers—glycin and hydroquinone, singly and combined, gave what may be termed normal results on halves of stale plates, the companion halves being badly fogged with pyro and other developers in common use. The hardness or contrast was in no case objectionable, and the only real drawback to the methods of development was the very long time of development—mainly because of the retarding action of the bromide—and the difficulty of judging density, the appearance (quality) of the unfixed plate being a little deceiving. Efforts to shorten the time of development by exposing more fully, lessening the amount of bromide and increasing the temperature, met with no success, fog appearing in each case.

There now remain the methods of development calling for the addition of "foreign" salts to what one may term normal developers—pyro, metol-hydroquinone, etc.—or the use of supplementary baths. All stale plates—"surplus" and home-staled—withstood the tests remarkably well, though the results obtained were much too hard for everyday use; the methods, however, may be safely employed for copying too soft originals and for line subjects.

The best of the "supplementary systems" is that calling for a bromide-bichromate restrainer made by dissolving 2 gr. of potassium bromide and 2 gr. of potassium bichromate in 1 oz. of water. This is used as follows: Take enough water to cover the plate to be developed and add about 20 drops of the special restrainer. Flow the mixture over the plate and rock for about two minutes. In a measure have ready any normal developer and pour the preliminary bath therein, return to the plate and develop as usual. If the plates are exceptionally bad one single drop of sulphuric acid may be added with advantage, but if the acid can be avoided so much the better. Plates to be developed by the supplementary bath system call for a very full exposure, and development is very slow indeed, so slow that a dish cover is advisable. This plan is perhaps the most economical one, and it may be recommended to those who do not consider the making up of a special developer worth while.

A quarter of a century ago, when I was employed in a Parisian photographic studio of world-wide fame, there was published a book entitled, "Ce qu'on peut faire avec les plaques violées" ("What to do with Fogged Plates"), and as the firm I was associated with had a large supply of them, I was given the task of making some experiments. The best method we could discover, and by far the most troublesome one, was to treat the plates before exposure with a bichromate solution (potassium bichromate, 50 gr.; hydrochloric acid, 5 drops; water 5 oz.) afterward washing well and drying in the dark. The plate were as sensitive as they were originally when all the bichromate was washed out, but when any was left in the plate was slowed down. The plates were used successfully for copying in the studio and in the Louvre. Any normal developer with bromide will serve for plates bichromated as above, but we secured the best and brightest results by soaking the treated and exposed plate for ten minutes in a very weak tartaric acid solution (5 gr. of acid in 10 oz. of water), and developing, after a rinse in water, in a normal hydroquinone developer, but with double the amount of potassium bromide. The process is one that can be recommended, but it is a very troublesome one if the worker has no proper conveniences for drying the treated unexposed plates.

Many other methods of treating stale and badly-kept plates have been tried during the past few weeks, but a recital of them would be of no real service, because of their utter uselessness or difficulties in carrying out. Only those methods have been given that are of service. The one for a photographer to employ will depend very largely upon the number of plates he has to treat, what the plates are to be used for, and his facilities for carrying out the necessary operations. The worker who has but a few stale plates—either those home from service abroad or those that have suffered at home—will try the bromide-bichromate restrainer named above, while he who has a large stock will look around for some Kachin or pyrocatechin, and, failing to secure any, will fall back upon the easily-obtained, and very nearly as good, hydroquinone and glycin, singly or combined, not forgetting potassium bromide, which has saved so many old and fogged plates from the dust-bin in the past.

The plates experimented with, it may be stated, were of the ordinary type and not color-sensitive. I have a fairly large stock of old panchromatics with which experiments may be made at a future date. A few I have exposed and developed in the usual way appear to be quite good, and to have lost none of their color-sensitiveness.—L. Tennant Woods, in *B. J.*

Enlarging Methods

To most people the mention of enlarging apparatus only suggests the magnified magic lantern which is so generally used, and for small negatives, say, up to half-plate or even to whole-plate size, this type is convenient and leaves little to be desired. When the diameter of the condenser exceeds ten inches practical difficulties have to be encountered, and these are not so much inherent in the design as in the optical imperfections which cannot be eliminated without an outlay which would be prohibitive to any but the most wealthy purchasers. In order to obtain a sufficiently good light with a large apparatus, the electric arc is usually employed and this, although theoretically perfect, has a way of finding out imperfections in the grinding of the condenser as well as in the annealing and uniformity of density in the glass itself. Hence dark patches with color fringes, which alter in position upon the screen when the light is moved, but which cannot be got rid of altogether. With a large illuminant, such as an incandescent mantle, these defects are less evident, because the source of light is larger, and rays from more widely separated points falling upon the condenser simultaneously tend to equalize the illumination over the whole field of the lens. In a similar way the introduction of one or more pieces of ground glass tends to the same end, but at the expense of illuminating power—a serious matter if a dense negative has to be dealt with, unless the size of the arc which is being used is out of all proportion to the work which is usually required of it. From some recent experiments we are led to believe that a solution of the difficulty will be found in the use of one of the smaller nitrogen-filled lamps of the type generally known as "half-watt." In the pattern which is most suitable for our purpose the filament is made in the form of a fine spiral, like a bell spring, which is bent into a circular form so that it gives an apparently solid ring of light, which is horizontal when the lamp is in a pendent position. In order to make the best use of these lamps, this ring of light must be parallel with the surface of the condenser. There is thus a temptation to fix it "end on," but this does not conduce to the longevity of the lamp, for not only is the filament more likely to fracture, but the blackening of the bulb, which should be confined to the specially designed neck, is spread over the whole surface. It is, therefore, a better plan to have the lamp in its normal position, and to transmit the rays to the condenser by means of an ordinary mirror, silvered on the back, the direct light from the side of the spiral being cut off by a metal or asbestos shield. Those familiar with the Howellite gas lamp for projection will readily see the necessity for this.

So far we have assumed that expense is no objection and that shortness of exposure is of great consequence, in order that slow papers of the Kodura or Cyko types can be used for enlarging as well as the more rapid bromide papers. If this be not the case, excellent results may be obtained without the use of a condenser at all, a powerful light being placed behind the negative and diffused by means of two or even more thicknesses of ground glass. In this connection it may be noted that most of those who have used this method have failed to avail themselves of the great aid of an efficient reflector. If an ordinary silvered concave glass reflector, such as is commonly used behind gas lights in passages and corridors, be properly adjusted, a brightly illuminated disk will be projected upon the ground glass diffuser. The illumination will be more even and the exposures reduced by at least one-half. Even four pieces of silvered glass fixed in the form of a hollow pyramid, with the light in the center, will give greatly increased evenness and strength of lighting.

Of direct lighting systems of this class the specially designed "gridiron" pattern of mercury vapor lamp is probably the nearest to perfection we are likely to obtain. Here we have a set of short parallel tubes emitting an intensely actinic light, which are placed comparatively near the negative with a ground glass diffuser between. This arrangement is extensively used in America, but does not seem to be so widely known in this country as its merits warrant. Enlarging by daylight is little practised in this country, possibly because the work can only be proceeded with at certain times, and these times are usually otherwise occupied. If there is a possibility of putting a small skylight in the dark-room roof and fixing a nearly vertical enlarger beneath it, there can be nothing simpler or cheaper. In former years a great firm made thousands—perhaps millions—of collodion transfer enlargements in this way with perfect success and ease of working; but in these days it would not do to have to wait for good daylight to make an enlargement for Press purposes. Nevertheless such an apparatus forms a very useful addendum to the ordinary enlarging lantern, when an order comes in for a large print from a 12 by 10 negative.

Illumination of the negative by reflected light has been recommended by some, and various lighting attachments have been devised for the purpose. They are all very similar in design. A white screen is fixed behind the negative, and two or more powerful lights are placed so that it is as evenly illuminated as possible. The results obtained are excellent, but, except for small sizes, the exposures are unduly prolonged, even the rapid papers requiring exposures of three to thirty minutes with two small arc lamps and a lens working at a normal *f*/8. With very thin negatives results can be obtained which cannot be equalled by any other method, but with dense ones it is impossible to get detail in the highlights with any exposure in reason. A point which must not be overlooked is the distance between light, reflecting screen, and negative; this should be adjustable, so that for small negatives the illumination may be made stronger, while for larger ones, in which more surface has to be used, the light can be equally distributed over it.

Toning Gaslight Prints with Uranium and Sulphur

THERE appears to be a great deal of misconception about the use of the salts of uranium as a toning agent. The question has often been asked, what is uranium, because the name has so often occurred in the line of photography. Uranium is a metal; it was discovered by Klaproth, a Swedish chemist, in 1789. It is obtained from pitchblend or uranite, these substances being the natural oxides of uranium. The name uranium was given this metal after the planet Uranus, which had then been discovered by Dr. Herschel, the astronomer. Today it is well known that uranium and its salts possess the properties of radium, only in a lower degree; in fact, radium is regarded as an offspring of uranium, this latter metal being often spoken of as the parent element.

There are three salts and two oxides of uranium: the sulphate, chloride, and the nitrate. It is this last salt that is used mainly in the art of photography. It can be used either as a sensitizing agent or a developing agent. With these subjects the present article is not intended to deal. The use of the nitrate of uranium as a toning agent for the changing of the color of a weak black platinum print into a beautiful Bartolozzi red is very well known. When these prints are properly treated to secure the right color, their permanency appears to be as good and in many cases better than thousands of the prints made today by some of the silver printing-out processes.

The writer possesses many of these uranium-toned prints that were made eleven years ago, and not a single print has faded during this time. The whites are perfect, and the color remains the same. In the case of uranium toning the color obtained is due to a deposit of the ferrocyanids of uranium, and it will be invariably found that where failure occurs to secure the right color it is due to the ferricyanide of potassium (red prussiate of potash) having been exposed for some time to the action of daylight, which affects the salt and makes it useless for toning purposes in combination with the salts of uranium.

Some very charming colors can be obtained upon prints made with the gaslight or artificial light developing papers. The solutions need not be made as strong as those that are used for the toning of platinum prints.

Solutions made up as follows will prove satisfactory, always bearing in mind that the more acid the bath is made the more intensely red will be the resultant print. Several prints can be toned in the bath at the same time, although it is advisable not to attempt to tone too many at a time.

For the toning of the ordinary developed print, make up the following mixtures, and label the bottles No. 1 and No. 2. The uranium salt may be made up in a white glass bottle if no other kind is at hand, but the ferricyanide of potash solution must be made up in an amber-colored bottle owing to its sensitiveness to light.

No. 1 Solution

Nitrate of uranium	60 gr.
Distilled water	30 oz.

No. 2 Solution

Ferricyanide of potassium (red prussiate of potash) . . .	60 gr.
Water	30 oz.

For making up the correct toning solution, take equal parts of No. 1 and No. 2. Be sure and mix them under a weak artificial light (make under ordinary gas jet) and carry out the toning by this light. Add to the mixture (if dry four ounces of each are used) one ounce of acetic acid No. 8; rock the tray so that the solutions are well mixed, then place into it a dried print that has been thoroughly well washed prior to drying; now rock the tray so that the solution flows well over the print, and continue the rocking, when it will be seen that the print changes color rapidly. As soon as the print has reached the desired color, remove it and wash well in running water; in fact until the yellowness has disappeared from the drapery and the whites of the print. It may then be blotted off in clean blotters and hung up to dry by means of a clean wood clip, and when dry trimmed and mounted like any other print.

Where a gaslight print is to be sulphur-toned the procedure is entirely different. The two following formulæ will give excellent results, the brown color and sepia being perfect in every way. Make up the following solutions:

A

Water	24 oz.
Ferricyanide of potash . . .	1 oz.

B

Water	24 oz.
Potassium bromide	1 oz.

C

Water	60 oz.
Monosulphide of sodium . .	½ oz.

The bleaching bath is made as follows: Mix in a tray five ounces of A and five ounces of B, add a few drops of strong water ammonia, place the print into this mixture, rock the tray, stop as soon as the print has become well bleached, remove it and wash well in running water for five minutes or more. Then place the print into a separate tray containing about ten ounces of the sodium sulphide solution, and it will change in color to a beautiful rich brown. Now wash the print well for one-half hour in running water, after which it may be dried and mounted.

The following formula will give a very beautiful sepia when used as a bleaching agent:

Bleaching Solution

Chloride of lime	2 oz.
Common alum	½ oz.
Water	30 oz.

Warm this mixture slightly, then immerse the print, and keep the tray in motion until the print is completely bleached. Then wash the print well in running water for fifteen minutes and place the bleached print into the following mixture:

Sulphite of soda	½ oz.
Water	20 oz.
Sulphuric acid	2 drams

The above mixture must be stirred well before immersing the print. By this means a color is obtained quite different to the previous formula; the tone is very agreeable, and all that will be required after this sulphurizing will be to give the prints a thorough washing in running water for one-half hour before drying or mounting.

If a darker color is required the process must be repeated, but in 99 cases out of a hundred the single operation is all that will be required.

Telephoto Lenses for Professional Work

As a body professional photographers do not seem to have taken very kindly to telephoto lenses, evidently considering them only fit for amateur "stunts," such as making large pictures of clock dials and weathercocks at a distance of half a mile or so. This feeling has, I believe, been created to a great extent by the specimen pictures published by the lens makers, who are naturally anxious to demonstrate to the utmost the capabilities of their instruments. It will perhaps help the professional to a better understanding of the telephoto lens if we consider it as an ordinary lens of greater focal length than usual, but needing only ordinary camera extensions—a lens, too, of which the focal length is adjustable, so that images on different scales may be obtained from the same standpoint. It will then be recognized that such a lens is a valuable tool in the hands of a practical man.

As many photographers have never troubled their heads about this kind of lens, it may be necessary to explain that in its simplest form it closely resembles one tube of an ordinary opera-glass—that is to say, it has a positive lens in front and a negative lens behind, with some arrangement for varying the distance between them. As a matter of fact, although not properly corrected for photography, it is possible to make very passable telephotographs with an opera-glass fixed on an ordinary camera. There is rather a large variety of sizes and models issued by different optical firms, but they may roughly be divided into three classes: (1) non-adjustable —*i. e.*, fixed focal length telephoto lenses, such as the Telecentric and Bistelar; (2) telephoto lenses with an adjustment for varying the focal length, such as the Zeiss Magnar, Dallmeyer Adon, and others; and, (3) portrait, rapid rectilinear, and anastigmat lenses, fitted with a telephoto attachment, which can be screwed on in a moment, when needed, without at other times interfering with the usual work of the lens.

The first class is usually of low magnifying power, and differs little from an ordinary lens in its manipulation. It is extensively used on reflex and other cameras for rapid exposures, and in some cases the large aperture (*f*/5.6) permits of portraiture in the studio. It should be noted that, in common with all telephoto lenses, the plate covered is small in relation to the focal length used.

The second class is useful for a wider range of subjects when rapidity of action is not essential. The little Adon is a well-known example of this type, and although simple in construction, is capable of much useful work. I therefore take it as a type to illustrate the working of telephoto lenses in general. The front or positive lens has a focal length of 4½ inches, and the back lens a negative or minus focus of 2¼ inches. By varying the distance between these by means of the rack adjustment we have a wide range of focal lengths. Thus with a camera extension of 5 inches we have an equivalent focal length of 14½ inches and a maximum aperture of *f*/13, the plate covered being 4¼ x 3¼. At 11 inches camera extension the focal length is 26½ inches, the aperture *f*/26, and the plate covered about 8 x 6. At 20 inches extension the focal length is 44½ inches, the aperture *f*/44, and the plate covered 15 x 12. These figures give a general idea of what a moderate-power telephoto lens will do.

The third class is usually of somewhat similar power to the Adon, as it commonly consists of a combination of a positive lens of any convenient focal length, with a negative lens of half its focal length, although for special work negative lenses having a focal length one-fourth that of the positive may be used. Such a combination is termed a high-power lens, as it gives a proportionately larger image with the same camera extension. I am purposely avoiding the term "magnifications," as this I consider has led to misunderstanding in the past. The equivalent focal length at the time of exposure is the point of interest to the photographer who does not care whether it results from three magnifications as compared with one lens or six with another.

The manipulation of a telephoto lens is quite simple, and the only difference from the ordinary procedure is that focussing is best effected by using the rack and pinion of the lens attachment instead of that of the camera. With a moderate-power attachment—that is to say, one-half the focal length of the positive—the equivalent focal length is twice the camera extension (measured from the back surface of the negative lens), plus the focal length of the positive lens. Thus, when using an 8-inch rectilinear fitted with a 4-inch negative lens, we have at an extension of 16 inches an equivalent focal length of 40 inches, and so on for all other sizes. The focal length in this case being increased five-fold, the *f*/No. on the iris must be multiplied five times, so that *f*/8 temporarily becomes *f*/40. Having decided upon the camera extension, all that is needed is to rack the sliding tube of the attachment in or out until a sharp image is obtained. This must be done very slowly, much in the same way as when using the coarse adjustment of a microscope, or there is danger of passing and repassing the point of sharp definition without knowing it. It might be imagined that with apertures of *f*/40 or less long exposures would be required, but these are greatly reduced by another factor, the distance between lens and subject so that in many cases half or even a quarter the exposure indicated by a meter for an object, say, at 36 feet, would be sufficient.

A color-screen usually adds considerably to the brilliancy of the result when distant views have to be dealt with, but it is not necessary for near subjects in which there is no perceptible haze over the deepest shadows.

Plates which give density readily are the best for this class of work, and I have found the "ordinary" and slow ortho rapidities preferable to extra rapid brands. The Imperial Special Rapid is about the fastest plate I should recommend.

Development usually takes longer than for close-up views. A full-strength developer should be used and development carried on until all action ceases. I have turned a plate face down supported by four bits of glass in the corners in a normal pyro-soda solution, containing a little bromide solution to prevent chemical fog, and left it for forty-five minutes, the resulting negative being an excellent one.

The applications of the telephoto lens are many and varied, and cover a much wider field than is generally imagined. In ordinary view work its value is obvious, as its elasticity of focal length enables a subject to be taken from the most advantageous standpoint upon any desired scale, so that the proper amount can be included upon any size of plate. For architectural details it is unrivalled, whether the result is a fine piece of carving for study or illustration, or a piece of faulty work, cracked or subsided for use in a legal action. When the London tubes were projected the houses under which the tunnels would pass were carefully surveyed and telephotographs taken of all existing cracks or distortions before commencing work. In quite another field of study photographs of statues scores of feet above the ground were taken for the purpose of identifying them as the work of the same artist, little mannerisms being clearly shown in the prints.

For catalogue work, especially of small articles which have to be depicted in their full size, or nearly so, the telephoto lens is again a winner. Let anyone compare a print of a snuffbox taken full size with, say, a 12-inch lens and a telephoto at 20 inches camera extension. For flower photography the telephoto is excellent, much greater depth of definition being obtainable, while some lenses add a slight softness to the outlines which gives a better idea of the texture than the dead sharp images usually obtained.

For portraitures its use is somewhat limited on account of the small working aperture of most models, but the Telecentric makes an excellent portrait lens. Lenses upon the same principle are, I believe, to be placed upon the market by two other firms.

The foregoing is not in any way intended to give full working instructions, but rather to outline the properties and uses of the telephoto lens to those who have hitherto neglected it. Several excellent books have been issued on the subject, and these can be referred to for fuller information.—*B. J.*

The Hand-Camera in Professional Photography

The hand-camera is, of course, the principal tool of the Press photographer, who has made a fine art of its manipulation, often obtaining results which appear even more wonderful to his brother of the studio than they do to the layman. We do not, however, purpose to discourse on the achievements of the Pressman, but rather to deal with the possibilities of the hand-camera in general photographic practice. There are many photographers of great practical experience and undoubted skill who still regard all hand-cameras as toys, and characterize all successful results as flukes, believing that the percentage of satisfactory exposures to be capable of expression only by a fraction—not even 1 per cent. But the skilled hand-camera worker knows better than this. His actual proportion of failures may be greater than that of the stand-worker, but the actual number of printable negatives is much greater, for he can make exposures in circumstances impossible to the tripod user, and often the plate which has only had a sporting chance turns out to be a winner. The professional photographer who is taking up hand-camera work will do well to become an amateur for the nonce, and to "get his hand in" on subjects which will not involve any risk of loss of money, or, what is worse, loss of reputation, in case of failure. That such practice is necessary we can assert from the experience of more than one worker who has acquired an expensive instrument, rushed out with it at once on an important job and failed to obtain anything worth looking at. Of course, the camera was blamed and laid aside as too faddy and only fit for an amateur. What a different story might have been told if a couple of dozen plates had been "wasted" in thoroughly mastering the mechanism and gauging the capabilities of the lens and shutter.

Very careful attention must be given to the selection of the type of camera, and the nature of the model must largely depend upon the work which is most likely to be undertaken. We are inclined to recommend the reflex as being best suited to the photographer, who has always had the help of the focussing screen, although its weight and bulk detract slightly from its useful ness. Still, for child portraiture out of doors, animals, "at home" work, and the like, the reflex has many advantages. As in any case the negatives will have to be enlarged, we do not recommend using larger than post-card size, and in the majority of cases quarter-plate will be preferable. It is desirable that in addition to the short focus lens, usually fitted, one of greater focal length should be carried, eight inches not being too long for a quarter plate. This lens should have as large an aperture as possible, as it will be mainly used for portraits and animals, allowing a fair-sized image to be made at a distance which will ensure pleasing perspective. Most of the *f*/4.5 anastigmats are well adapted for the purpose, or if the photographer happens to possess a suitable portrait lens, such as Ross C. D. V., or Dallmeyer's 2.B, he will find it an excellent substitute. Folding cameras of the Goerz-Anschütz type have their good points, but require a longer apprenticeship before they can be used to the best effect, the judging of distance being the greatest pitfall for the inexperienced. Moreover, they are not so well adapted for fitting larger lenses as is the reflex. Twin lens cameras have many of the advantages of the reflex, but as a rule are minus a reversing back; and upon near subjects an allowance has to be made when placing the image upon the focussing screen on account of the difference in the viewpoints of the new lens. Such cameras may, however, often be purchased quite cheaply at second-hand, and are well worthy of the attention of the frugal photographer. The question of plates *vs.* films is one that most photographers will decide in favor of the former, but it is a wise precaution to have a film-pack adapter fitted, so that an ample reserve of exposures is to hand. In the smaller sizes the pack films are flat enough not to cause any trouble even with such apertures as *f*/4 or *f*/5.6.

As to the uses to which the hand-camera can be put, we need say but little, as every worker has his own requirements, but a few suggestions are offered. First and foremost comes the portraiture of children and animals. In the case of the former often the only way to secure a pleasing result is to "stalk" the juvenile with a reflex, snatching any happy pose which may present itself, while in the latter, although more deliberate working is possible, a change of possition does not create the difficulties which it does when using the tripod. In home portraiture the small size of the camera and the absence of a focussing cloth make the work easier in a confined position and less trying to invalids and the aged. A hand-camera also affords a ready means of securing a series of post-card views, even when visiting a district for other purposes, while an occasional "snap," available for the Press, will soon repay the cost of the outfit. As we have already hinted, the enlarger is the necessary complement of the hand-camera, and in order to save time and trouble the focussing should be done by scale, or a fixed focus enlarger should be used. There is really no reason why the strip system should not be adapted to enlarging, so that even quite cheap work could be turned out at remunerative prices.—*British Journal of Photography.*

Dry Collodion Emulsion

[For many special branches of photography, ferrotypy, photographing on wood, watch dials, opal plates, etc., dry collodion emulsion plates by their fineness of grain and thin films possess special advantages. We extract from the authoritative text on the subject—"Collodion Emulsion," by H. O. Klein.—Ed. P. J. of A.]

Generally speaking, collodion emulsion may be used for every kind of photographic work for which wet collodion or gelatin dry plates have hitherto been used. The treatment and method of handling will differ according to the purpose to which it is applied. We accordingly set forth the different processes, commencing with the oldest and simplest applications, such as to ferrotype plates, wood blocks, leading up to the more complex negative making processes in which color sensitizers are introduced into the emulsion. First, however, we deal with the preparation of the glass plates.

Only new glass should be used, as scratches show in the negative.

The plates should be immersed in a strong caustic potash solution, if they are old negatives, so as to free the glass of the film. If they are new glass plates immerse them for a few hours in

Bichromate of potassium . .	2 oz.
Sulphuric acid	3 oz.
Water	25 oz.

Rinse under the faucet and polish with an alcoholic solution of caustic potash or iodin and finally polish with a clean pad of linen charged with a few drops of ammonia and alcohol. The plates cannot be kept clean for a long period as the action of the atmosphere very soon forms a deposit on the polished surface.

The effect of unclean glass on collodion emulsion is much more marked than in the case of a wet collodion plate; the plates are to be coated with great care as streaks and other imperfections on the surface will show when the plate is developed.

It must be borne in mind that the surface of plate glass is considerably softer than that of ordinary sheet glass, due to the removal of the hard surface in the process of polishing.

The ordinary sheet glass is therefore less liable to be injured by an excessive immersion in strong acid baths than is plate glass.

Substrata

In most cases the writer prefers polished plates without a substratum, applying only a rubber solution to the margins to make the film hold to the glass. If for any reason, however, a substratum is desired, the following can be recommended:

India rubber (best Para)	1 part
Anhydrous benzole (or chloroform)	500 parts

This is flowed all over the glass, and may in more concentrated form be used for edging. Albumen is a useful substratum, and the following is a good formula:

Water	80 oz.
Albumen	1 oz.
Ammonia	1 min.

The substratum which we have found most reliable is given in the following formula:

No. 1

Gelatin	50 gr.
Acetic acid	3 oz.

The gelatin is warmed until dissolved.

No. 2

Water	3 oz.
Chrome alum	10 gr.

Take 10 parts of No. 1, 1 part of No. 2; Columbian spirits, 70 parts, and filter.

The plates must be dried in a room free from dust or in a drying cupboard. Heat can be applied and the plates will be ready for use within a minute. It is, however, advisable to coat several plates, before wanted, so as to allow the acetic acid to evaporate and to cool the plate.

If the plate is not perfectly cold the ether in the collodion emulsion will evaporate during the process of coating and an uneven film will be the result.

The presence of acetic acid also causes considerable decrease in sensitiveness, and is very marked in emulsions which are sensitized with ethyl violet.

A substratum is especially useful with emulsions which are not sensitized with the Dr. Albert's sensitizers, as several aniline dyes have a tendency to make the film float off the glass. This is prevented by the action of the picric acid which is present in Dr. Albert's sensitizers.

A substratum will also be needed if the plates are to be developed with the hydroquinone developer, which makes imperfections in the glass and polishing marks visible. If glycin is used this precaution need not be taken. A mixture of hydroquinone and glycin has been found to answer even with ordinary polished glass, but for half-tone work hydroquinone alone will give the best results, and a substratum, preferably the last quoted one, will have to be used.

Coating the Plates

The emulsion is well shaken in the dark room for at least ten minutes, to get the bromide of silver particles, which settle at the bottom of the bottle after standing, uniformly and thoroughly dispersed in the emulsion. The operator should let the bottle stand for another two minutes and then coat the plate after dusting it well.

Most operators are well acquainted with the coating of the plate with collodion, but for the benefit of those who never worked collodion plates I will describe the right procedure.

Hold the plate in a horizontal position by means of a pneumatic plate holder, dust with a soft camel's hair brush, pour a small quantity of the emulsion into the center of the plate so as to form a circular pool, and gently tilt the plate first to the right hand and then to the left hand top corner, finally toward you to the left bottom corner and slowly drain back into another bottle from the remaining corner.

Do not tilt the plate too quickly and drain slowly, rocking the plate from right to left, so as to avoid thin films and streaks.

As soon as the emulsion has set (which can be determined when the finger makes an impression on the surface) the plate can be color-sensitized, or, if the sensitizer has been incorporated with the emulsion, it can be placed in the dark slide for exposure.

The dark slide should be carefully dusted before commencing the day's work, and wiped out clean at the end of the day to free it from drainings of emulsion. Dark slides which have been used for wet collodion work should never be used for emulsion, as the dry silver nitrate forms chemical dust which causes black spots if it settles on the plate.

Th emulsion must not be poured back into the same bottle, but filtered into a separate bottle. Collodion pourers have often been suggested, but I believe have not proved a success. The pouring-on bottle should not be allowed to become covered by spilt emulsion, because the latter will dry and, peeling off, probably fall onto the plate during coating. This bottle and the tin in which it is stored should be kept spotlessly clean, the mouth of the bottle to be wiped after coating. Cork or rubber stoppers should not be used, as the former cause dust spots, and the latter possibly destroy the emulsion, if not made of pure rubber. von Hubl suggested the following arrangement: Take a piece of wood about four inches square, and cut into this a circular groove into which mercury is poured. Into this groove place a light-tight circular card-board box open on one end. Under this box the collodion emulsion pouring bottle is placed. The bottle will now be protected from actinic light, and as the mercury forms a fairly air-tight compartment, evaporation of the solvents will be avoided. The top of the box will have to be made of (or covered with) lead, so as to make the box sink well into the mercury.

Keeping Qualities of Emulsion

The collodion emulsion of commerce in its plain state before the addition of certain color-sensitizers, especially those which are silver compounds, will keep for several years. The addition of most sensitizing dyes does not impair its keeping qualities. If, however, silver eosine or other compounds of dyestuffs with silver are added, as, for instance, the sensitizers "A," "RP," "R," "P," of Dr. Albert, the emulsion will only keep a few days, and in hot weather probably only a few hours.

The life of collodion emulsion thus sensitized can be greatly prolonged by keeping at a very low temperature, and if such sensitizers are to be mixed with the emulsion, it is advisable to prepare small quantities, such as can be used up during the day's work. The newer sensitizers, as, for instance, pinaverdol, ethyl-violet, and homocol, can be mixed with the emulsion and it will still keep for a very long time, showing extremely clear working qualities.

Developers for Collodion Emulsion

Dissolve:

Sodium sulphite	2½ oz.
Distilled water (hot)	4 oz.

and add

Glycin	1 oz.

and

Carbonate of potassium	5 oz.

The order of mixing as stated above should be carefully followed.

The solution forms a thick paste, and will keep for years if well stoppered. For use dilute:

Glycin paste	1 part
Water	12 parts

This forms the usual developer. If greater density is required, the following developer is recommended.

A

Distilled water	20 oz.
Sulphite of sodium	10 oz.
Carbonate of potash	8 oz.

B

Hydroquinone	1 oz.
Water, distilled	4 oz.

C

Ammonium bromide	1 oz.
Water, distilled	4 oz.

Mix the three solutions and keep as stock. For use dilute 1 in 10.

This developer, introduced by Dr. Albert, does not keep so well, but gives extremely brilliant negatives of good density.

The density of the negatives can also be varied by increasing or decreasing the amount of hydroquinone in the developer.

Collodion emulsion plates can be fixed with hyposulphite of sodium or cyanide of potassium. The strength of the hypo solution should be about 1 in 4.

Collodion emulsion plates must always be washed *before* development, because the alcoholic surface would repel the aqueous solution of the developer, and so cause streaks and markings.

The time of development should not exceed one and a half to two minutes. Development can be performed while the plate is held in the hand or in the dish. For uniform development the dish development is preferable, especially in color work. Accelerators or restrainers are of little use in emulsion work, where correct exposure is a desideratum. It will generally be found that the image on an accurately exposed plate appears in about thirty seconds in the hydroquinone developer, and in about fifteen seconds in the glycin developer.

The above formulæ represent the developers generally in use, and in the case of half-tone work are the only developers which will give good results. For ordinary continuous tone work almost any developer may be employed —adurol, metol, rodinal, all of which give negatives only differing in color and brilliancy, but equally good. A higher percentage of bromide in these developers will probably be needed.

The usual hydroquinone developer furnishes exceedingly clear but hard negatives, a quality most desirable in process work, but very objectionable in the continuous tone reproduction of an oil painting, for instance. Glycin yields considerably softer negatives, especially if used in a very diluted form, but the color of the negatives is of a yellow brown, which, however, can be changed for a more beautiful blue gray by a short application of very weak mercury intensifier and ammonia.

This will probably serve the additional purpose of increasing the density of the negative, which is generally below the average for ordinary silver printing. The complaint often made that emulsion negatives are hard and devoid of detail in the shadows is not justified, because the softest and best graduated negatives have been made with emulsion by proper choice of developer and sensitizer.

A. *Ferrotypes*

Collodion emulsion can be used for the making of ferrotype dry plates for portraiture. The ferrotype plate is well polished with a few drops of alcoholic iodin solution, dusted and coated on a glass plate support.

To coat a ferrotype plate evenly is by no means easy. The plate should lie flat, and the surface must not show scratches or chipped off parts in the enamel. Preservatives can be used if the plates are not immediately wanted. Chemically pure tissue paper should be placed between the plates when they are dry. Drying can be accelerated by means of a drying oven, or for small work a hot-water bottle or bath. To ascertain whether the plates are in good working order, one of them should be placed in the developer for about one minute without previous exposure, washed and fixed. The black enamel should not be dulled with the silver deposit, and the plates should look almost as if uncoated. Glycin and hydroquinone are suitable developers, the application of which should only last from fifteen to twenty seconds. The color of the silver deposit can be changed if different developers are used, but for most purposes the formulæ given will answer very well.

Developer for Ferrotype Plates

A. Sol. 1

Distilled water	24 oz.
Sulphite of soda (specially pure)	10 oz.
Carbonate of soda	8 oz.
Ammonium bromide	1 oz.

Sol. 2

Hydroquinone	1 oz.
Distilled water	4 oz.

Mix and label the solution A.

B

Carbonate of potassium	6 oz.
Sodium sulphite	12 oz.
Glycin	1 oz.
Water	10 oz.

Powder the sodium sulphite well and add the glycin after everything is dissolved. Mix and label the solution B.

C

Hypo	1 oz.
Water	10 oz.

For use take:

A, 3 drams;
B, 3 drams; water, 9 drams;
C, 10 to 20 minims of water.

This developer gives a white silver deposit, clear shadows, and its action is rapid enough for very fast work.

The addition of color-sensitizers, as pinaverdol, homocol, etc., gives very pleasing results, the coldness of the white image giving way to a warm pink shade more resembling flesh tints. The plates are also speedier and work exceedingly clear from fog.

B. Photographing on Wood

Collodion emulsion has been found very useful in photographing upon wood for wood engraving purposes, giving a photographic film which is thin enough to permit subsequent tool work without chipping. The wood block is coated in the usual way with a white pigment mixed with gelatin. The edges and back of the block can be rubbed with wax to make it water-proof.

The collodion emulsion of commerce is diluted with equal parts of alcohol and ether, and the wood coated with it in the usual way. The drying can be accelerated by placing a hot glass plate half an inch over the sensitized surface and by fanning the block. If conditions of light remain the same, it will be well to definitely ascertain the required exposure from a good standard negative at a given distance from the source of light, by covering the negative partly and giving a series of different exposures on the same block. The development is done in the hand and should be finished in about two minutes.

Any alkaline developer can be used, but we strongly recommend the following:

Water	10 oz.
Metol	75 gr.
Sulphite of soda	$1\frac{1}{4}$ oz.
Carbonate of soda	$1\frac{3}{4}$ oz.
Bromide of potassium	10 gr.

Dissolve the metol in water before adding the sulphite. For use dilute with equal parts of water.

Glycin is not suitable, because the silver deposit is of a yellowish-gray color and does not show the fine details in reflected light. Fix in hypo solution 1 to 4.

A very weak solution of bichloride of mercury, and subsequent ammonia, will change the brown image into a bluish-gray one and make it more visible.

It may be advisable to mix a small quantity of chemically pure glycerin with the emulsion, which will act similarly to a preservative and so ensure quicker development and more brilliant prints.

It is of great importance to wet the block as little as possible, and to see that nothing remains on the surface to clog up the point of the engraver's tool or cause the wood to become friable, making the delicate lines crumble and break away.

C. Lantern Slides, Opals and Transparencies

Although the collodio-chloride emulsion gives a greater range of color, collodio-bromide emulsion will answer most purposes, and in the case of transparencies or lantern slides, which are to be made in the camera, will even become a necessity.

The opal or glass plate is well cleaned and polished with a solution of iodin in alcohol, edged with a rubber solution or coated with a substratum (see p. 34).

The substratum is well filtered, the coated plates dried in a place free from dust and coated with emulsion. Care must be taken to shake the emulsion well before use, because the bromide of silver settles after standing for some time and almost completely separates from the ether and alcohol when left undisturbed. The same modes of development, exposure, etc., as described for wood engraving are also to be used in this case.

If the plates are to be kept for some time before exposure the well-known beer preserver can be used.

Pyrogallic acid	15 gr.
Bitter ale (Bass' ale will do)	16 oz.

The plates are immersed in this solution until all greasiness disappears, then dried spontaneously. The above formula is from Sir. W. Abney's *Photography with Emulsions.*

Another very good preservative is made by dissolving 6 grains of gallic acid in 1 ounce of alcohol.

Of this solution, 120 minims are mixed with 10 ounces of emulsion.

A good lantern plate of higher speed can be made by adding to this emulsion 5 minims of pinaverdol solution, 1 to 500 alcohol. This emulsion will keep for several months.

Photographic Materials and Processes

Coloring matters of flowers; Use of —— in color photography. P. R. Kögel, Phot. Korr., 57, 86—91. Chem. Zentr., 1920, 91, IV, 60.

Several of the benzopyrillium compounds occurring in flowers are shown to have a relatively high light-sensitiveness. The anthocyanins, which by themselves are light-fast, can be made very light-sensitive by the addition of sensitizers, *e. g.*, o-anethol to cyanidin hydrochloride. *o*-Anethol can occur as a degradation product in plants, so that it would appear that these dyestuffs can form their own sensitizers. An objection to the use of an anthocyanin in the bleach-out process is its low covering power.

Printing-out papers; Recording the characteristic curve of ——. F. Formstecher. Phot. Korr., 1920, 57, 191—197.

A "first" print on the paper to be examined is made by exposing through a paper-scale of known opacities. After rendering the base of this print transparent by soaking in paraffin oil or wax, a second print is made on any suitable paper through the first print and the exposure scale placed at right angles to one another. Lines of equal density, "Iso-opaken," on the second print represent the required characteristic curve.

Print-out papers; Color [of the image] in —— and factors affecting it. F. Formstecher. Deuts. Opt. Wochenschr., 1920, 33—34. Chem. Zentr., 1920, 91, IV, 156.

The color of the printing image depends on the size of the precipitated silver particles, which is affected by the initial condition of the sensitive silver salt and also by the strength of the printing light and by moisture. Emulsions with a low proportion of citrate give blue images, the particles becoming finer grained and the color redder with increasing quantities of citrate. The redder images have also a softer gradation.

PATENT NEWS

Color photography. Natural Color Pictures Co., assignees of W. F. Fox. E. P. 143,180, 14.10.19. Conv., 12.5.19.

Prints are made in register from two complementary color-sensation negatives on opposite sides respectively of a transparent base sensitized on both sides. Both prints are toned to a color corresponding to that through which one of the negatives was taken, then the positive printed through that negative is toned in a solution which will change the tone already obtained to its complementary. For example, if a red and a green filter have been used in taking the negatives, the first toning bath may be a uranium ferricyanide solution and the second toning bath, applied to the positive from the "red" negative, may be a ferric ammonium oxalate solution. In the second toning operation, the solution may be applied to one side by a suitable rolling or brushing device, or the side not required to be toned may be protected by a waterproof coating.

Photographic sensitizing dyes of the isocyanin type; Process of making ——. L. E. Wise and E. Q. Adams. U.S.P. 1,338,346, 27.4.20. Appl., 10.2.19.

Photographic sensitizing dyes are prepared by the interaction of sodium methoxide in absolute methyl alcoholic solution with mixtures of the quaternary halide addition products of an α-methylated quinoline derivative and a γ-unsubstituted quinoline derivative.

Photo-sensitizing dyes effective for infra-red radiation, Process of making ——. E. O. Adams and L. E. Wise. U.S.P. 1,338,349, 27.4.20. Appl., 4.4.19.

Infra-red photographic sensitizing dyes are prepared by the interaction of air and sodium methoxide in absolute methyl alcoholic solution with the quaternary halide addition products of $\alpha\gamma$-dimethylated quinoline derivatives.

l.57. No. 12 December 1920 20 Cents

The Photographic Journal

of America

DEC 13 1920
National Museum

Published Monthly
With Illustrations

ANSCO
5 x 7
PRINTING MACHINE

Price: $10

This Ansco Printer takes the bother out of printing. The amateur photographer who uses it gets more uniform results, more conveniently, and in shorter time. It makes printing sure and simple in any kind of room that has electric current. It is especially well adapted to the requirements of the commercial photo-finisher.

DETAILS: Takes negatives up to 5 x 7; has ruby glow and uses a standard 40-watt Mazda lamp as the printing light; lower window provides orange light for developing prints, and ruby safe light for developing plates and films.

Built with the same care for essential *rightness* that has made Ansco cameras famous.

Ansco Company
Binghamton, N. Y.

THE PHOTOGRAPHIC JOURNAL of AMERICA

REGISTERED IN THE UNITED STATES PATENT OFFICE

NEW SERIES: WILSON'S PHOTOGRAPHIC MAGAZINE

AN ILLUSTRATED MONTHLY DEVOTED TO THE SCIENCE AND ART OF PHOTOGRAPHY

THE OLDEST PHOTOGRAPHIC MAGAZINE IN AMERICA
Founded 1864

Incorporating:
The Philadelphia Photographer The Photographic World

THOMAS COKE WATKINS, Editor

CONTENTS FOR DECEMBER, 1920

Home Portraiture "Professional" 457
A Production of Panchromatic Sensitiveness Without Dyes
J. D. Capstaff and E. R. Bullock 460
The Background 462
Editor's Table—Advancement—The Christmas Spirit 466
Courage 467
The Studio—Practical Papers on Studio Work and Methods 468
Views and Reviews 473
Among the Societies 476
The Workroom 480

YEARLY SUBSCRIPTION, in advance, postage paid, United States, Mexico, Cuba, Philippines and Porto Rico, $2.00; Canada, $2.35. Countries in the Postal Union, $2.75. Single copies, 20 cents.

REMITTANCES may be made at our risk by money order, check, draft, or registered letter.

SUBSCRIPTIONS begin with current issue.

Published by EDWARD L. WILSON COMPANY, INC.,
THOS. C. WATKINS, President. 701 Arch Street, Philadelphia, Pa.
EXECUTIVE and EDITORIAL OFFICES, CAMERA BUILDING, 122 EAST 25th ST., NEW YORK CITY
HOUGHTON'S, Ltd., London, Eng., Agents for Great Britain
American News Co., Distributors for U. S. Kodak Australasia Ltd., Sydney, Agents for Australia
RICHARD HILL, Devonport, Auckland, Agent for New Zealand

Entered at Philadelphia Post-office as Second-class Matter

This is one of a series of sketches on Leading American Photographers

American Photographers

LOUIS FABIAN BACHRACH:—In 1868—fifty-two years ago—David Bachrach of Baltimore founded the organization that bears his name. Since then, the chain has steadily grown until today it includes studios in practically every prominent city of the East.

One of the men responsible for this progress is Louis Fabian Bachrach, now in active charge of the New England group of Bachrach Studios. His artistic instinct and keen executive ability, have contributed materially to the notable success of the organization of which he is a part.

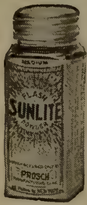
All of the Bachrach Studios enjoy the highest prestige. This is undoubtedly due in no small measure to the fact that they have insisted on the best quality of workmanship and equipment.

It has been our pleasure to supply the Bachrach organization with an astounding number of our lenses, principally the F:4.5 Velostigmat and the Verito. The uniform excellence of their work testifies to the wisdom of their choice.

The Series II Velostigmat F:4.5 here pictured is used extensively by the different Bachrach Studios for groups and home portraiture.—Of course, they use the Verito too.

WOLLENSAK OPTICAL CO.

ROCHESTER, NEW YORK.



Sensation in the Photographic Line

The Brieloff Universal Studio Lamp in your studio assures you of even light at all hours of the day or night. You do not have to depend on the uncertain daylight, nor disappoint your customers. The least touch will adjust any reflector in any way for portraiture or in group. A single spotlight will help even with daylight for special lighting. All adjustments automatic. Price - - - - - $20.00 and up

The Prosch Home Portrait Bag is very practical for individual, small groups or banquet work; can be operated in series, and it will pay you to have a set, for you can never tell when you may be called on a job. Complete outfit, ready for use - - - - $22.50

Send for a full description on

Prosch Smokeless Flash Bags
Sunlite Flash Powder
Blow Lamps
Brieloff Studio Lamp
and the latest improvement, the
Hand Flash Lamp

Prosch Mfg. Co.
DEPT. W
61 Fulton St. New York

HEYDE'S ACTINO PHOTO-METER

Eliminates Guessing in Photography!!

The simplest, most effective and most accurate instrument for determining correct time for exposure.
Easily and quickly manipulated; compact and always ready for use.

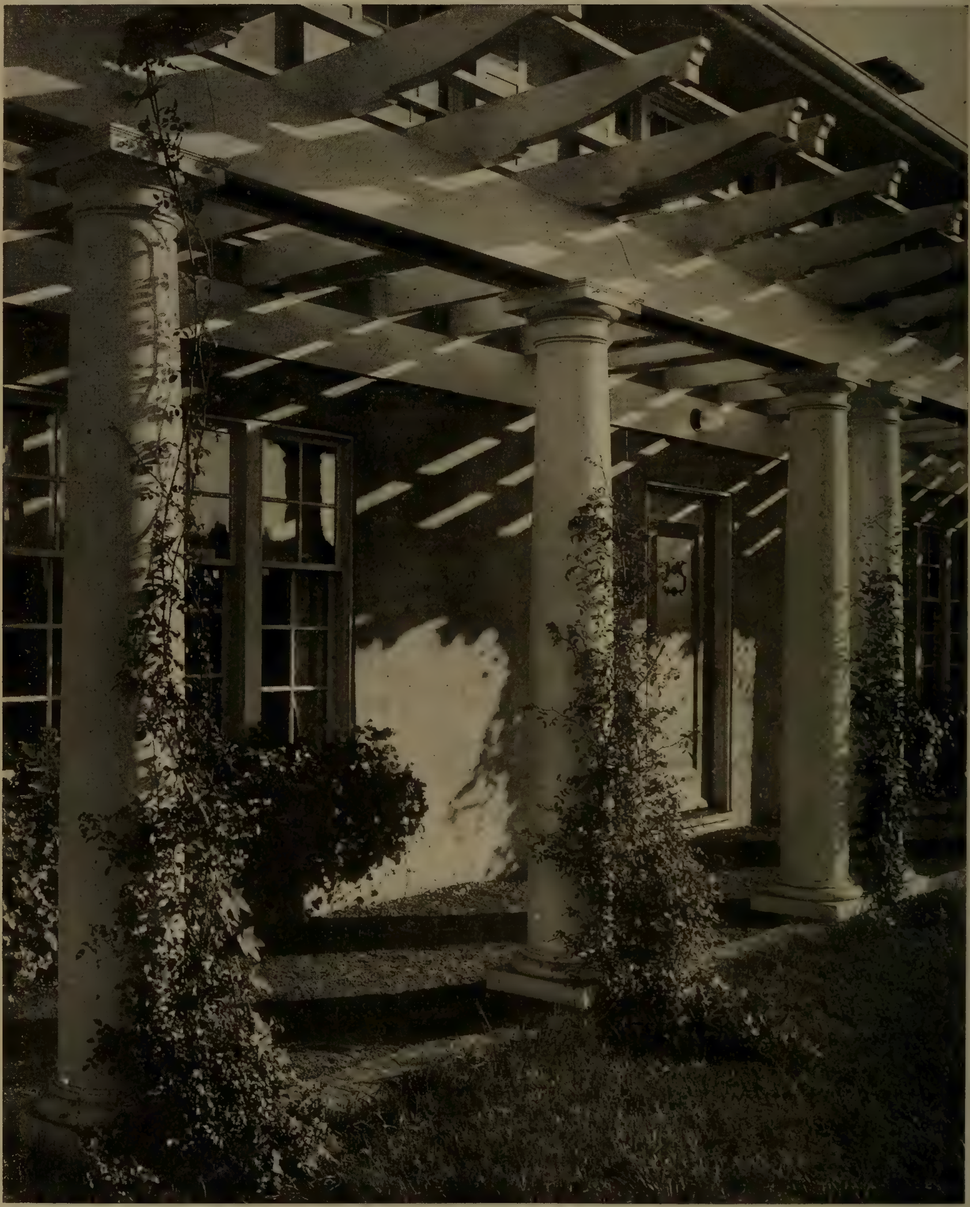
No Sensitive Paper Used For Tinting

Exposure table complete on dial.
Essential to the Photographer who wants perfect pictures.
Order by mail or from your dealer.
Write for descriptive booklet.

New Vest Pocket Model
Size Dia. 2-3/8" x 13/16" Thick
Price $10.

Dealers: A postal will bring our special offer.

HERBERT & HUESGEN CO.
18 East 42nd. Street
NEAR 5TH AVE., NEW YORK.



A LOGGIA IN SUNLIGHT—LATE AFTERNOON
BY MATTIE E. HEWITT
NEW YORK

The
PHOTOGRAPHIC
· JOURNAL ·
· of AMERICA ·

VOLUME LVII DECEMBER, 1920 NUMBER 12

·THE·AUTHORITY·FOR·THE·PROFESSIONAL·PHOTOGRAPHER
PJ A
FOUNDED 1864

HOME PORTRAITURE

By "PROFESSIONAL"

HOME portraiture is all the more interesting and fascinating on account of the rather tough propositions that are always coming up during the process of making it. As an offset to the difficulty at times experienced, is the development of yourself as a resourceful worker, which is most valuable, and also the great variety of work that you produce, making a collection of pictures all the more interesting to the public to whose taste we cater. It is, as we all know, very hard in the practice of our profession, under ordinary circumstances, to prevent our work from being all more or less of the same character. This fails to create the enthusiasm over our pictures by the possible purchaser who visits our studios, which is very necessary to encourage their sitting frequently, and otherwise extend our business. Whether we make much of a pursuit of the work or not, as a business proposition in itself it surely is advantageous for our indirect success that all of us at times go into these things like home portraiture as a trade-getter.

As a means of livelihood for the professional, considered independently of a regular studio with complete appointments, I should with much earnestness advise considerable caution. Our ranks are today provided with a number of amateur, semiprofessional, and strictly professional home portraitists. Some of these gentlemen do work of a very high order, and their success has attracted a great deal of attention.

At first glance it may appear that making a specialty of home portraits is a good money-making way of doing business, as the rent and other expenses of running a studio are done away with, and one could have his office at his residence; but the amount of the work done in the locality in this way is rather limited, besides requiring peculiar gifts in the ability to get a constant flow of customers.

The rumors of high prices in connection with this work are, I think, the cause of so much attention being given it, whereas the pictorial effects so easily possible when making the work should attract all photographers to it.

The people who can afford to pay high prices for these pictures naturally expect to receive value for their money. It is evident, therefore, that he who would do this work should have a superior knowledge of pictorial effect and ability to produce it. Added to this is the ability to accomplish all kinds of faking to overcome difficulties and assist in the carrying out of good ideas. This faking of the negative and of the print also during printing is ever present with you. To succeed, it is of vital importance. The mere process of development is not a mechanical one, but requires slow, careful work, to obtain the very best possible out of an exposure which, if it had been made in the studio, would have been discarded.

Then, again, the high prices themselves, often obtained, are often an injury to the future of your business, if these same prices impress people as unreasonable. It is also a mistake to think that even the very wealthy don't object mentally, even if they do pay the bill. This fact has within a few months come to my attention in connection with an artist in a distant city where I reside. He informed me that he knew positively that his trade had been hurt in a certain section or circle because a patron, who was well able to pay what she ordered, paid him a large amount of money for a large order which she gave him, knowing full well what the bill was to be. She told her friends what the price was she paid, without informing them particularly how much work she had. It spread rapidly, and her friends, less wealthy than this patron, went elsewhere for their work. He had expected great results from this circle of friends, but never had one of them.

In passing, it may be well for us not to pat ourselves on the back (or hire someone else to do it if we can't reach it ourselves) when we receive a large remuneration for a limited number of pictures. It is well to bear in mind that if the product is such that we wish and hope for other work to come from it, it would be far better in the end if we arranged our prices, to some extent at least, so as to render possible the patronage of a number of her friends. Arrange these things, therefore, to bring some returns for this special fine thing you've made, and not let it go to waste, with only the one person as the result of it.

The ability of the artist and the excellence of the work made should receive proper returns, without giving the public an idea that the prices are extortionate.

In the making of home portraits, the general illumination of a room in a house is far less than under our skylights, and if the surroundings be also dark, then there are no reflections, and the results will likely be black and white; hence the need of a small reflector, which may be nothing but a towel or newspaper held up by an assistant or some member of the family, on the shaded side of the customer, and a little to the front. In doing this, watch that you do not reflect too much light to spoil the shadow eye, or flatten out the shadow ear, making a noticeably dark and inky place from the nose nearly to the ear, and there very light.

Placing towels over the top of a two- or three-flap screen, to be found in most every house, answers the purpose very nicely, as at three or five or even more feet away it reflects back sufficient light to illuminate without destroying the character of the sitter's expression. Blue tissue paper laid over the screen instead of white towels or cloths is also very good, and perhaps better.

Get a lens that works quickly, cuts well, and doesn't require too great a distance, working reasonably near without distortion. A quick-acting, good lens is of great advantage.

A general rule for lighting the subject is to place her as far away from the light as the width of the window, and a little back from the window sash or frame work. By this means the full, direct light from the window, continued in a straight line as it travels, will pass practically in front of the face. The subject, however, will receive a mellow and powerful light, and by placing the chair a few inches this way or that, with suggestion to the subject of changing her position so she will face the window more, or *vice versa*, very beautiful effects of lighting are easily obtained in the fact (the more especially) and on the figure.

A narrow window and bright light will most likely produce strong contrasts, but this can be easily modified by changing location of the chair. Work to do all you can with the light itself, and make it a point to only use a reflector when absolutely necessary.

If in lighting you can get a little of the natural light on the further cheek, and still find room for your camera, the results are better. If you do this, and this light on the shadow cheek appears as very hard and sharp, then without changing relative position of chair with the window, place the chair a few inches or a foot farther away, and you'll find that the light in the cheek will still be there, but, not being so strongly marked, it will have softened or spread over the rest of that side, thus reducing the contrast, rendering almost unnecessary a reflector.

In bust portraits try and have the bulk of the light come from the upper part of the sash, screening the lower part of it with blue tissue, being careful in so doing that you don't prevent having a little snap of high-lights on the forehead and nose and a little less on the skin. Avoid extremes, however. A little doesn't mean so much that it merges all of the values of the face into one large white spot. Have just enough to prevent flatness, and so the head will be admired on account of the character or feeling that it has substance, and the face well delineated because its various facts are well indicated.

Fine pictures are made by experts where all sorts of combinations are made as to location, strength or weakness of the light, combined with the successful carrying out of all sorts of seemingly impossible effects; but you grow to this. Be satisfied in the first place to succeed in the preliminary stage, then your ability will be such as to successfully tackle and overcome more difficult things.

I have left for the last what is of vital importance, and that is the plate you use. By all means, for serious work of this kind, use ortho- or isochromatic or panchromatic plates. All good non-chromatic plates will make house portraits, but it seems to me that with house portraiture a color plate only should be the one generally used. Why? Because all the things in the room that take black, strong shadows in the face, etc., with an ordinary plate all take the same quality of black, or very nearly so, and the white objects are now unduly white amidst the gloom.

The isochromatic plate, used without a screen or filter, will show great differences between the darks in the negative and will hold down too pronounced whites, or at least bring them nearer together as they appeared at the time. Don't try to make a reputation in home portraits with ordinary plates. Give it up and start straight.

A PRODUCTION OF PANCHROMATIC SENSITIVENESS WITHOUT DYES[1]

By J. G. CAPSTAFF and E. R. BULLOCK

IN the course of some experimental work carried out by one of the writers, in 1917, with ordinary plates, in which the plates were being bathed in certain solutions prior to exposure, it occasionally happened that the emulsions fogged badly on development. The cause of the fogging was puzzling, because the plates that showed the defect had apparently had the same treatment as those that developed clean. Investigation showed that the treatment undergone by the plates had rendered them panchromatic, and that their erratic behavior regarding fog was mainly due to the time they had been exposed to the red light of the dark-room, which had been considered safe with the type of emulsion being experimented with before receiving the treatment referred to.

By a process of elimination it was finally discovered that the color sensitizing was caused by the use of a sodium bisulphite bath, followed by a lengthy washing. As the phenomenon was thought to be new and to be of theoretical interest, work was commenced to determine the conditions which conferred the maximum color sensitiveness and, if possible, to explain the effect.

Considerable work has from time to time been devoted to the problem, but to date no entirely satisfactory hypothesis has been evolved, the most plausible being that the treatment results in a partial reduction of the silver salt to colloidal silver, which is known under certain conditions to act as an optical sensitizer. The work is being continued, and a detailed account of the experiments will be given later. It is thought, however, that a brief summary of the most fruitful experiments carried out so far will be of interest.

The effect is not peculiar to any one type of emulsion, but most of the trials were made on Eastman Commercial film. Figure No. 1 is a wedge spectrograph showing the normal spectral sensitiveness of this emulsion.

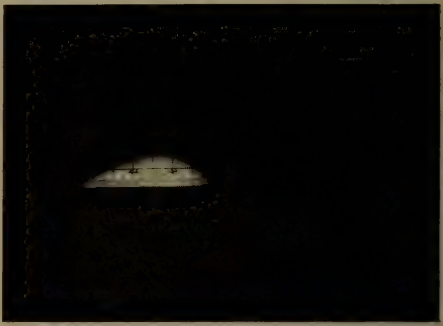


FIG. 1

In one experiment six pieces of film were bathed in 2 per cent. sodium bisulphite for ten minutes, the temperature being 70° F. They were then washed, in running tap water (temperature about 60° F.) for the following times:

No. 1.	Washed	5 minutes
No. 2.	Washed	15 "
No. 3.	Washed	1 hour
No. 4.	Washed	5½ hours
No. 5.	Washed	24 "
No. 6.	Washed	30 "

All were allowed to dry spontaneously hanging in a well-ventilated dark-room. The temperature averaged 70° F.

Wedge spectrograms showed progressively increasing color sensitiveness with washing time. Illustrations of Nos. 1 and 6 are given. The abrupt ending of No. 6 at 800μ (due to screening of the film by the film-holder) indicates that the sensitiveness extended well into the infra-red.

The fog density increased with the color sensitiveness, varying with normal development from .07 in No. 1 to .41 in No. 6.

A similar series washed in distilled water showed only the normal sensitiveness, and washing in tap water without the preliminary bisulphite treatment gave a degree of color sensitiveness so slight that its existence was overlooked in the earliest experiments, but which was subsequently found to be invariably produced on prolonged washing. Soaking in a large volume of water or solution (*e. g.*, 2 liters for one 3¼ x 4¼ film) was always found to have the same effect as washing in running water, provided that in each case the temperature was the same. Tap water boiled down to various extents and then cooled was found to have very much the same effect as untreated tap water.

---

[1] Communication No. 92 from the Research Laboratory of the Eastman Kodak Company.

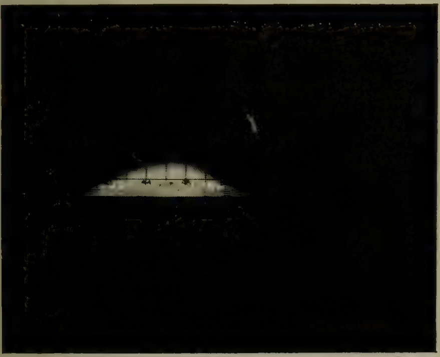


FIG. 2

The addition of alkali to the tap water reduced the time of washing necessary and increased the general sensitiveness. The film of spectrogram No. 4 had the following treatment:

Sodium bisulphite 5 per cent.	10	minutes
Washing	5	"
$\frac{N}{10}$ sodium carbonate . . .	10	"
Washing	5	"

It was later found, however, that even better results were produced by a 0.2 per cent. distilled water solution of pure potassium bicarbonate which was neutral to litmus and free from chlorides.

Sodium sulphite, as the preliminary bath, apparently has no action. Sulphurous acid has. It seems then that the effect is due to the sulphurous acid content of the sodium bisulphite solution. This is confirmed by the fact that the addition of a little sulphuric acid to the bisulphite accentuates the action of the bath.

Extremely small percentages of soluble bromides or chlorides in the washing water or the carbonate bath diminish the effect, and .004 per cent. of potassium bromide or .2 per cent. of sodium chloride is sufficient to prevent color sensitizing entirely. No noticeable restraining action occurs, however, if these are present only in the bisulphite.

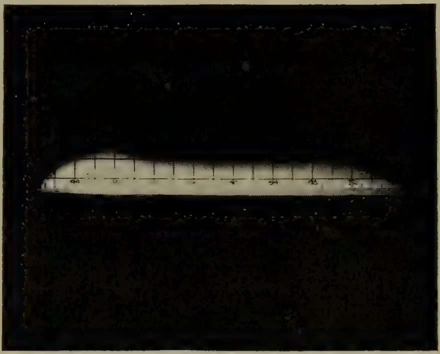


FIG. 3

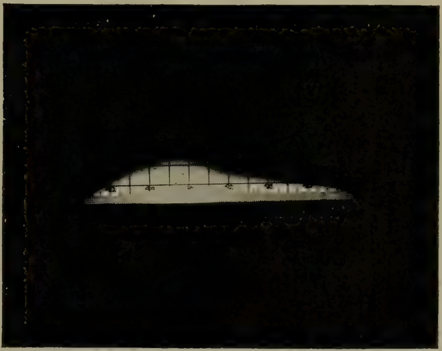


FIG. 4

Numerous other experiments were tried with more or less inconclusive results, and the investigation so far has given so many inconsistencies that the writers prefer to pursue the work further before discussing the matter in fuller detail.

THE BACKGROUND

ONE of the commonest defects the ordinary photograph shows is the force of outline of the figure against the background. A good general rule to observe in this matter is that the figure should always merge into the background at some part, and generally in more places than one. Only in this way can the background and figure be made parts of one scheme of light and shade. The difficulty of getting the light and shade of the background to properly relieve the figure is one that frequently occurs, but for half-lengths and head and shoulder portraits it may be practically overcome by employing a number of grounds slightly varied. In his *Treatise on Painting*, Leonardo da Vinci says: "I would have the painter to accommodate that part which is enlightened so as to terminate upon something dark, and to manage the dark parts so that they may terminate on a light ground." And in another place: "The ground which surrounds the figures in any painting ought to be darker than the light part of those figures and lighter than the shadowed part." This method will give the maximum of relief, and, of course, great force and vigor to a portrait, but it is quite evident Leonardo meant it to be used with discretion, for in another chapter he says: "A face placed in the dark part of a room acquires great additional grace by means of light and shadow. The shadowed part of the face blends with the darkness of the ground, and the light part receives an increase of brightness from the open air, the shadows on this side becoming almost insensible, and from this augmentation of light and shadow the face has much relief, and acquires great beauty."

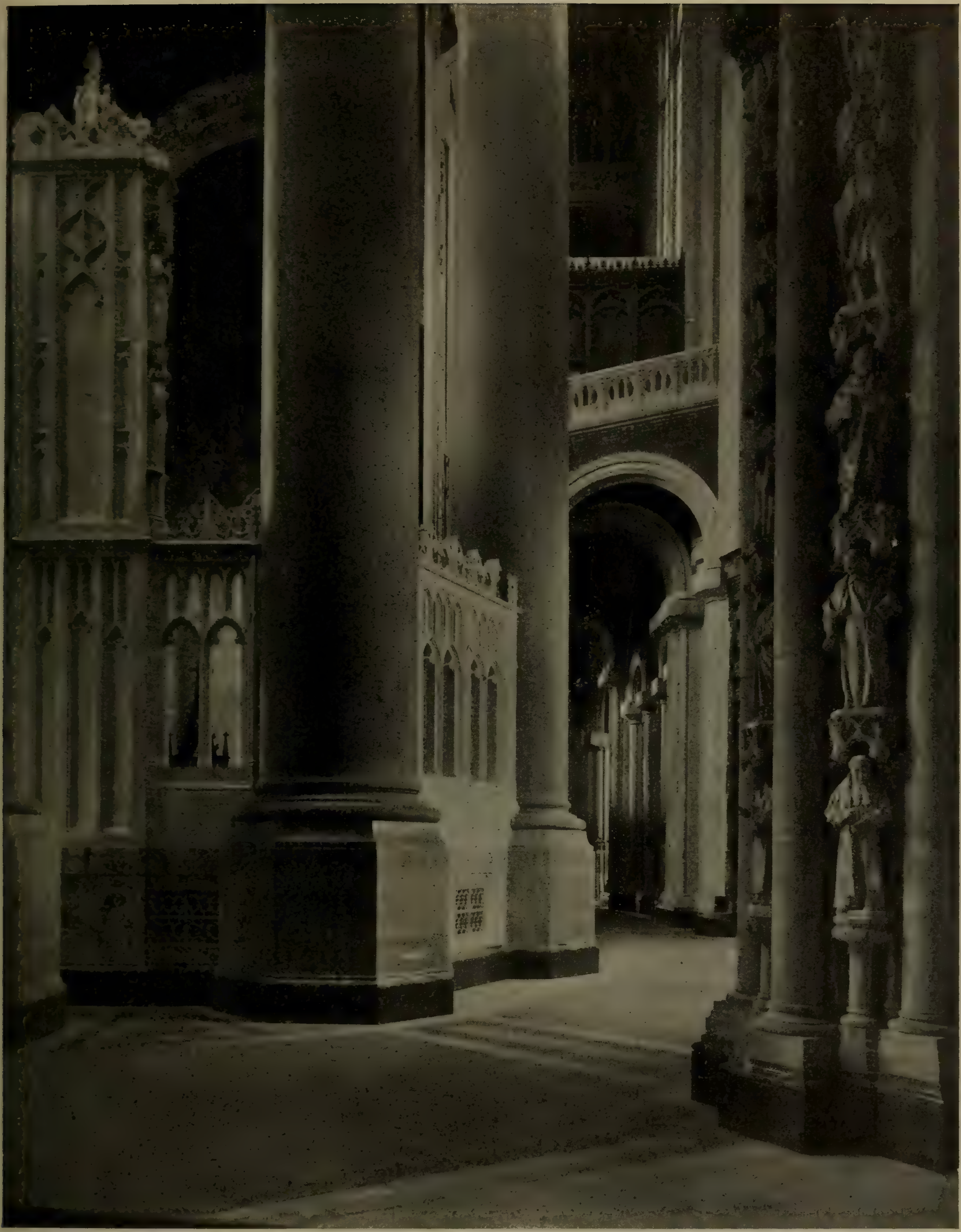
Sir Joshua Reynolds advocated this relieving of dark with dark and light with light in one of his "Discourses." Sir Joshua, however, adopted both methods and doubtless selected that most appropriate to the subject of his portrait.

This appropriateness or "fitness" is, in fact, an important matter often lost sight of. Not alone in choice of background and force of light and shade generally should discrimination be shown between portraits of men and those of ladies and children, but accessories and occupation require thought. The observant operator finds out what interests the sitter, and so secured fitness, or no incongruity of pose, expression, or occupation; at least, this must be so if portraits are to be produced expressing individuality. A footnote to Leonardo's instruction as to representing children, old men, old women, and so on, says: "The author here speaks of unpolished nature; and, indeed, it is from such subjects only that the genuine and characteristic operations of nature are to be learnt. It is the effect of education to correct the natural peculiarities and defects, and, by so doing, to assimilate one person to the rest of the world." The tendency in commercial photography is to eliminate "the natural peculiarities and defects," and though one aims at a little idealism, care should be taken to avoid reducing all portraits to a "dead level of commonplace excellence," as H. P. Robinson phrased it.

The influence of the background on exposure has been repeatedly mentioned by Mr. Harold Baker, but it may be well to note the points to which he has called attention. In general a shorter exposure may be given, say for a head and shoulders portrait, when using a dark background than when a light-gray vignette ground is employed. The difference is sometimes as much as between one and three seconds. All the lights in the face are accentuated by the dark ground, and care should be taken not to carry such exposures too far in development, or a hard, chalky effect is produced.

Having considered the arrangement of the lines in the picture, and the disposition or scheme of light and shade, we are still left with the question of focussing or the sharpness or softness of definition.

We have seen that the lighting may be so managed as to emphasize or subdue certain parts of the subject, but it will be evident that a diffused or softened outline will be much less insistent than one which is sharp and clean-cut. Certain



AMBULATORY—CATHEDRAL OF ST. JOHN THE DIVINE
BY MATTIE E. HEWITT
NEW YORK

parts of the picture call for a sharp rendering; others of less importance may be less sharp.

As a general rule, for the best pictorial effect, nothing should be really quite sharp except the eyes, but it will be found in the case of commercial work that a more general crispness is demanded. It is, moreover, almost impossible when working with the usual portrait lens, or with anastigmats, aplanats, or rectilinears, even at large apertures, to keep everything except the face softened in definition. Wherever any part of the subject is in the same plane there will be equal definition. In fact, the ability to arrange the figure suitably with regard to that particular plane which the lens is defining is one of the earliest difficulties met with in portraiture.

The more nearly important parts of the figure can be placed in the one plane, so that they may be in focus at the same time and with the plate in its normal position, that is at right angles to the principal axis of the lens, the more accurate will be the proportions of the various parts of the picture; the hands will be proportionate to the size of the face and so on.

The swingback may sometimes be used to get parts of the figure into focus that are in another plane from that of the face, but when this is done inaccuracies of scale are at once introduced. It will be apparent that if the head is, let us say, fifteen feet from the lens and is sharply focussed, and if the hands are thirteen feet six inches from the lens, and are sharp at the same time, they will be represented on a slightly larger scale than the face, just as a print which is being copied is brought nearer to the copying lens when we wish it rather larger on the focussing screen. If the hands are not sharp, however, owing to insufficient depth in the large aperture lens, and we employ the swingback to make them so, the scale is still further increased, because the focussing screen is moved farther from the lens, and the rays forming the image of the hands diverge still farther before reaching the screen. This is the case with any lens used for every-day practical work in the studio, but when lenses of too short focal length are employed the fault exists in its worst form.

I have not seen this point emphasized or even mentioned in any articles on portraiture, but it appears to me an important one, and a frequent cause of the complaint that "the hands are too large." It is one, of course, with which anyone who has studied the optical properties of lenses is quite familiar in theory.

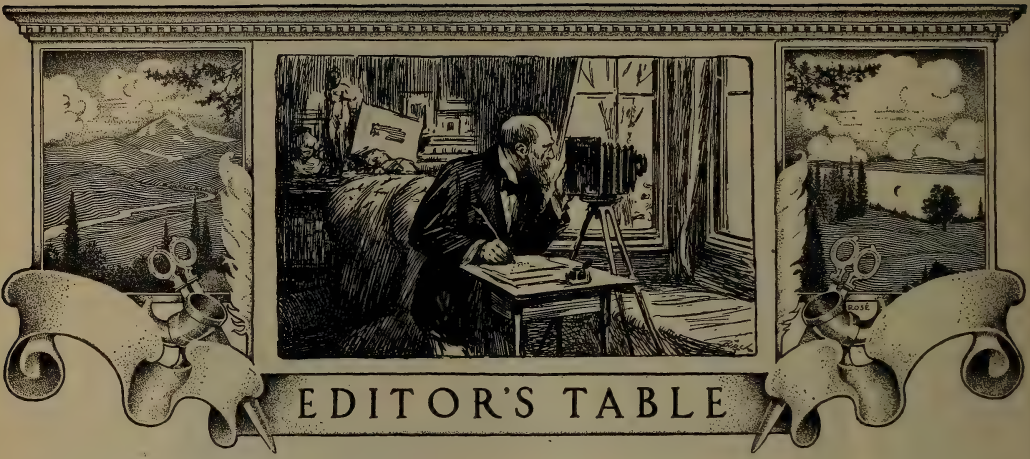
Harold Baker recommends the employment of the side swing as a means of getting the shoulders in focus, presumably when the figure is turned to a three-quarter position. The swinging of the back in any direction in taking portraits seems to me undesirable and likely to produce distortion. The following simple experiment may be tried: Place the camera on a copying board and adjust on the perpendicular easel a perfectly rectangular piece of white board, such as a cabinet mount. Now, with the swingback vertical sharply focus this, and then swing the back, either vertically or sideways. The image of the rectangular mount will be no longer true, but wider across one end or one side according to the way the back was swung. This can be measured, and what occurs with the mount must equally occur with the sitter.

Apart from the sharpness of the picture there is to be considered the amount of detail which we wish to render. This, of course, depends principally on the lighting, and to some extent on the surface of the paper on which we propose printing, but it is affected also by the length of the exposure. A short exposure will tend to subdue shadow details and to emphasize the gradations of the high-lights. On the other hand, a longer exposure will give a softer result, and the shadows will be more broken up. It is not desirable to shorten the exposure to such an extent as to produce shadows devoid of detail. Such a course tends to give heavy shadows with no transparency or depth.

The exposure demanded to a considerable extent will depend on the subject.

BY O. H. BOYE SAN FRANCISCO, CAL.

Thus, two sitters may be taken in rapid succession with an unaltered light, yet the exposure in the one case may be two or three times that in the other. In one case we may have a lady in a white dress in front of a moderately dark ground. Full strength of detail in the background is not necessary, but sparkle and good gradation are wanted in the dress. The exposure given may be a trifle more than the dress demands, but not so full as to flatten the high-lights of the draperies, care, of course, being taken not to develop too great density. In the second case, with a sitter in a large black hat and black velvet dress, a much fuller exposure will be needed, because strength of detail will be expected in what are essential parts of the picture.



EDITOR'S TABLE

THE CHRISTMAS SPIRIT

CHRISTMAS comes again. The morning glow of a new year tints the horizon of the world. The magic that fills our stockings with good things fills our hearts with even better things.

To the Editor, the Christmas spirit is very real. If there is any man among our readers who does not believe in the magical spirit to whom all things are possible at Christmas time, we want to tell him that he has let go the sweetest and most useful faith that ever gladdened tired humanity. And if there is any woman to whom this blessed spirit of Christmas has not whispered some message of thanksgiving or of hope, of resignation or of faith, of love or of forgiveness, surely she has our deepest pity.

This Christmas spirit, this good cheer, this exchange of gifts, is the greatest and best thing that can happen to any and all of us.

"Oh, Christmas spirit bring to me,
  A larger love for what is good,
A better faith in God and man,
  Of saving grace in brotherhood;
And from the islands and the seas,
  And yonder where the planets shift,
Bring hope and faith and love and truth,
  To be a world-wide Christmas gift!"

ADVANCEMENT

THERE appears to be a general depression in business still hanging over the country, and this affects the photographic profession as it does every other line of trade, especially those that deal in luxuries. Possibly it is the high cost of living, and it may be other things. As one sage of the country grocery store stated: "The high cost of living is caused by the high prices of things we now think we have to have, but which we used to do without." There may be a good deal of truth in this; but as long as there will be marriages, births, and deaths, photography will be a necessity.

A demonstrator going the rounds asked all the photographers what was the reason for the depressed condition of things. Some said it was the desire of the public to be satisfied with postals, which gave no profit to the photographer; others said it was the tendency of the people to save their money and not spend it for photographs, and still others said the penny postal craze and the simplification of photography had ruined the business.

Now, it is a fact that photographers who have got away from the postals have no real cause for complaint; if they pay close attention to their business and try to advance, they are getting as good prices as they ever did. It seems the profession has come to "the parting of the ways"—one is the making of artistic portraits by photography, in which there is good profit and not so much competition, and the other simply manufacturing photographs with an eye to the lowest selling price and cost—the simplest and easiest way. It is the line of the least resistance, as has been pointed out many times. There will always be some business in such photography, as a cheap price will always attract; but the public is slowly and surely getting dissatisfied with the investment in photography merely because it is cheap. It is that personal pride which everyone has, and in which personality the photographic portrait partakes—it stands for what the original thinks of himself—and we believe that the ability to deliver the artistic result will be recognized by the demand for more profitable work, and it will be more certain than many photographers appreciate.

This ability to buy good goods, including photographs, is more universal than is generally suspected. There are, possibly, persons who are so shiftless or such poor managers that they would have no money if their products brought twice as much as they now do; but it is a fact that many a person and his family come to town looking as though the whole family did not have one dollar to rub against another, when in fact he has money in the savings fund at interest or in the bank waiting to be invested.

COURAGE

COURAGE as an element in business is indispensable to success. It crops up in a hundred forms. It requires courage for the business man to tell the truth. Yet without truth and honesty behind it the good will of business is worth nothing.

It requires courage for the business man to make a business move. The move may be a mistake and it requires still more courage for him to take to cover.

It requires the highest courage to say "No" in so many cases where "No" is the only reply, and still more courage may be required for the man to hold to it.

It requires courage for a man to listen to a complaining customer and to admit frankly and generously that his house has been wholly in the wrong. Yet one of the most insistent and insidious ills that afflict business today is that dissatisfied customer who has been turned away still dissatisfied.

There is no element of courage in business more necessary than this courage to treat with the complaining customer. The honest, valuable customer does not complain until he is aggrieved, materially, or in his own fancy. But in either case he is entitled to a prompt hearing. Evasiveness in treating with such a man is the worst course that the business man can take. It leaves the customer in a worse frame of mind than when he first found fault.

Everywhere in progressive business affairs the customer is receiving more consideration than ever before. It is becoming fixed in the mind of the business man that without the customer and his good will a successful business is an impossibility. The best type of business man is taking his business to his customer, not waiting for the customer to find him out and do all the walking.

—*John S. Gheds.*

PRACTICAL PAPERS ON STUDIO WORK AND METHODS

The Printing Room

No matter how small a business may be the arrangements for printing should receive the most careful attention, and makeshifts only employed when absolutely unavoidable. In a one-man concern every device which will save time should be adopted, as the photographer's time is naturally of more value than that of a junior assistant. Moreover, proper rest is necessary to efficient working, so that even if an energetic man is willing to put in a sixteen-hour day he should refrain from doing so unless he wishes to bring on a premature collapse. I mention this because I recall the case of an unhappy man who opened his studio at 10.30 A.M., interviewed sitters and made negatives till 9 P.M. and did his printing and mounting outside those hours, his arrangement being so primitive that while negative work was in hand nothing else could be done.

If it be possible, a separate room, or at least a portion of the dark-room, if large enough, should be fitted up for printing exclusively, so that it can be carried on without interfering with other operations.

Adequate sink space is the key to easy work. I am rather a crank on this subject and would almost go as far as to put in sinks wherever there was room. As I have said many times it is easy to turn a sink into a bench by covering it over when not needed, and while the plumber is at work the extra cost is not great. Most dark-rooms are inadequately supplied with washing accommodation, and this is one of the greatest errors which can be made. Lead-lined sinks are generally recommended and for negative work leave nothing to be desired, but for printing I favor stoneware sinks, which can be used as washers for small and large sizes alike. Where large quantities are handled they are excellent for development as they save the cost of large dishes and avoid the risk of breakages.

As bromide and gaslight papers are used for the greater part of the prints now issued I will give details of a printing-room which I fitted up and from which large quantities of prints are being turned out. The room is about fifteen feet square and is fitted with benches along two sides and a row of Doulton stoneware sinks along a third. The entrance is on the fourth side, and this is so trapped that free entrance and exit can be obtained while work is in progress. On one bench are placed the negatives to be printed with the order forms, while below are drawers for storing sensitive papers. On the next bench are the printing-boxes, three being strip printers capable of taking any size up to half-plate, while two others accommodate negatives up to whole-plate and 20 x 16 respectively. Trays for unexposed and exposed paper are placed between the machines, and those containing the prints can be carried to the developing trays without unnecessary handling. Four large stoneware sinks are ranged close together for developing, fixing, and washing. In the first stands a porcelain dish containing amidol or M.-Q. developer; the second is filled with acid hypo, while the third and fourth serve for washing, water running into them the whole time. The prints are transferred from the hypo to the first sink, and after about ten minutes to the second, where the washing is completed. With this arrangement several thousands of prints in assorted sizes are easily made daily. This scheme may be carried out on any desired scale, a single printing-box and a couple of sinks being sufficient in the majority of cases. The point to be aimed at is the arrangement of apparatus so that it is always ready for use.

There are many good printing-boxes on the market, and it is better and probably cheaper to purchase one of these than to make one, although this can easily be done by anybody with a knack for carpentry. These should have a ground-glass diffuser and a vignetting arrangement. For this latter I prefer a sheet of clear glass on which vignette forms can be laid; it is then easy to modify the shape of an opening by putting another on top, or at one side, or by adding a torn piece of card. Vignetters and loose pieces can be kept in position by laying small weights upon them. For general use the printing-box should take negatives up to whole-plate, as a larger size means unnecessary labor in handling. If many large negatives have to be printed a 12 x 10 box and a strip-printing box to take up to half-plate will be found convenient. The illuminant will usually be electric glow lamps, from one to half-a-dozen being required according to the rapidity of the paper used. With such papers as Velox, Kodura, and Cyko, a short exposure to a strong light will give better results than longer exposure to a weak one, especially when vigorous negatives are being printed.

Where no current is available incandescent gas will be found a good substitute, but, of course, in this case the burner must be at the side of the box and the light received upon a silvered or enamelled mirror at the usual angle of forty-five degrees. Failing gas a good duplex or circular wick lamp may be used, care being taken to keep the burner very clean and to use only good quality kerosine oil. Acetylene is an excellent printing light, but should only be used in a very large and well-ventilated room. Used in close quarters it causes headache and nausea in many people. Whatever form of printing box be used it is desirable that the negative should be illuminated by red or yellow light, between the exposures, as this greatly facilitates the placing of the paper upon the negative. With electric light this is usually done by fitting a two-way switch and placing an extra, red and yellow, bulb beside the white ones inside the box. With gas or oil a yellow glass exposing shutter must be fitted, and this may conveniently be operated by a treadle. Boxes fitted with a single bulb only may be improved by fitting four pieces of ordinary looking-glass so as to make an inverted hollow pyramid; when correctly adjusted there should appear to be five lamps when the interior is viewed through the negative opening. When working with thin negatives it is easy to reduce the light to any extent by interposing thicknesses of white paper, the best position for this being on the surface of the ground glass diffuser. It is very desirable that the top of the printing box should be so fitted that a large sheet of paper can be used if needed, not only for white margin work but for multiple exposures upon one sheet. A very handy way of working is to make six cabinet exposures upon a 15 x 12 sheet. This is done by exposing three along one edge and then turning the sheet and exposing along the other edge. Not only does this tend to uniformity of color and depth but it saves time in handling and automatically sorts out the orders.

Some system of exposure test should always be available so as to ensure the best results from a difficult negative or when taking up a new brand of paper. Obviously the ordinary strip method cannot be applied to most printing boxes, but it is quite easy to make an actinometer plate by exposing an ordinary negative plate in strips to a weak light and developing fully out. This can be placed under the negative and a long exposure given; it is then easy to calculate the exposure required. A useful range is to make the scale so that the thickest end admits one-thirty-second of the light which passes the clear end.

For large work printing frames are necessary unless a printing box of exceptional rigidity of construction is available, and even then my preference is for frames of the box form. Most bromide paper is now on a fairly stout base and much more pressure is necessary for this than for the older printing papers. In exposing large prints it is desirable to work at a considerable distance from the light to secure eveness of illumination; twice the longest side of the plate is a safe distance.

The fixing-bath should be of goodly dimensions, with regard to the work to be done, and it should be replenished from time to time with fresh solution. It is a great mistake to allow the bulk of the bath to decrease much, as not only is the solution already weaker, but there is not sufficient for the prints to be moved about freely. Practically no amount of immersion without movement will safely fix a number of prints. I have tested some which have been massed together in the hypo for over an hour and found unaltered emulsion.

The washing after printing is of the greatest importance and does not usually receive the attention it requires. There is no better way for large or small quantities than hand washing from one sink or dish to another. If a range of three sinks with overflow plugs can be arranged the prints can be placed in the first direct from the hypo, the water running the while. When a good number has accumulated they are transferred singly to the second sink and so on to the third. If no assistant be available the printer should stop at, say, each gross of prints to make this change, or he may leave all in the first sink until he has finished his batch. But this plan is not to be recommended, as it leaves too many prints to be handled properly.

Platinotype printing is so simple that it requires little special arrangement, the only special appliance needed being a gas ring for heating the bath for sepia work. For exposing, a mercury vapor or arc lamp may be used in poor light; the arc if used direct is rather apt to give flat prints, so that it is preferable to use a pattern such as Northlight printing lamp, which gives a powerful reflected light. If this lamp be used it should be placed in a fairly large well-ventilated room.

For carbon printing a slightly different arrangement is necessary; the workroom should be fitted with a large deep sink with boards to confine the unavoidable splashings. The developing tank sholud be warmed by a gas ring below, or, failing this, have a constant stream of warm water running into it. I have found nothing better for this than one of Fletcher's open pattern heaters as fitted over lavatory basins. These supply an ample supply of hot water, and as the heat can be regulated they can be used by the addition of a smaller rubber tube as a "squirt" for local development. I have found plate glass the best covering for the mounting bench. Ample space should be allowed for carbon work so that no splashes from the alum bath are likely to reach the mounting board or developing tank.—*B. J.*

Photographing Pictures

THE photographer of today has an easy time, compared with a few years ago, when he has to copy pictures. An exposure of over twelve hours was often needed on stained glass windows, in the days when we had to use a twenty-five times screen. Now a few minutes will give a better result. One commission of this kind will not be easily forgotten. It was to secure photographs of the words and music of the "Te Deum" in some fifteenth century stained glass, which ran round three sides of a celebrated ancient chapel. It was twenty-seven feet from the floor, and every letter and note had to be readable in the prints. The whole chapel had to be filled with scaffolding, which took a week to put up, and when it was finished it was such as plasterers use, and two men were there to move the planks from one part to another as needed. As the letters and notes had to be taken on a large size on the plate the camera extension was considerable, and the scaffold was so lacking in rigidity that the slightest movement made the camera quiver, so our two guardian angels were sent down the ladder and time given for things to settle down, but we found that every breath we took made the camera shake just enough to spoil the negative. Fortunately we had a shutter with a fairly long tube, and we sat down on the camera box, waited until things were fairly steady, took a deep breath and held it while we squeezed the bulb. It was lucky the longest exposure was only a minute.

The development of panchromatic plates does not present great difficulty if a few experiments are made. It is necessary to standardize one's developer and temperature, and decide as to the kind of negative desired and by what process it is to be printed. It is usually best to keep the negative on the thin side rather than dense. Yet in spite of all one's precautions it is almost impossible to get a series of negatives on panchromatic plates of even density, but still they should be sufficiently alike to give equal prints with ordinary care in printing.

After many experiments with different developers we have settled down to pyro-soda, without bromide, and used at such dilution as will give the right density in five minutes. For it is decidedly monotonous to sit rocking a dish in the dark for a longer time. The developer is never used a second time. Of course, in large places where panchromatic plates are used every day this would be extravagant, as no doubt tanks would be used, but we are writing for the photographer who uses such plates occasionally; and it is more economical to waste a little developer than to spoil a panchromatic plate at their present price; and by using fresh developer for each plate it is easier to get uniform results.

It is occasionally necessary to intensify or reduce. For the former a reliable method is a modification of the old Edwards intensifier made by dissolving red mercuric iodide in a solution of sodium sulphite. It will keep indefinitely, and may be used after the negative has had five minutes' washing. The increase of density may be stopped at any point by merely taking the plate out of the solution and washing for five or ten minutes. Treatment with any non-staining developer for another five minutes is said to make the result permanent, and is followed by a short washing. For reduction Belitski's reducer is excellent, as it seems to attack the dense parts first; at any rate, it does not increase the brilliancy of the negative in the way Farmer's reducer does sometimes.

Copies of pictures look better if printed with a white border, especially if copies have to be framed, as the white edge gives a clear guide to the frame maker. It is difficult to cut paper masks for any size larger than half plate, so it is best to use an opaque pigment on the negative. Some find this difficult to do, but a ruling pen and a straight-edge, not too thick, and having one edge bevelled, will make the operation easy. If the ruling pen is a new one it will probably cut the film, as the edges may be sharp, but a few strokes on a fine oilstone will smooth them down. An old pen that has seen a good deal of service in ruling lines on paper is best. If the copy is square and true on the plate a pencil line may be run round parallel to the edges, using the tip of the middle finger as a gauge, but if the glass edges are sharp a cut finger may result. If, however, the image, as usually happens, is a little askew on the glass it is not easy to secure true rectangular lines in ruling, as there is nothing to guide one, and the edges of the picture are often not quite rectangular, however carefully the arranging on the focussing screen may have been done. This difficulty may be overcome by ruling a sheet of cardboard, considerably larger than the largest negative, with fine lines about half an inch apart, so that the surface is divided up, like a chessboard in squares. This is best done by pinning the card on to a drawing board with the edges accurately squared, and ruling lines with a T square from two edges. There is no need to measure the distance of the lines from each other; in fact, it is often an advantage to have their distances different. When a negative has to be masked the position for the lines may be marked on it with ordinary ink and a fine pen in a retouching desk, just a dot is sufficient. The negative is then laid down on the ruled card and the first line drawn with the ruling pen and the bevelled straight edge, the bevel side down, taking care that the line goes right up to the edges of the negative, which is then turned round and adjusted, so that the line just drawn coincides with one of the lines on the card, and the negative is pushed along or drawn back until the guide marks of the second line correspond with one of the other lines on the card and the second line is drawn. This is repeated with the two remaining edges, and we have a fine line drawn round the picture, too narrow to be of any use, but with a small brush charged with pigment it may be broadened to any extent, carefully working up to the ruled line. Before attempting to rule the guide lines, the film must be cleared of all traces of dirt and grease left by handling; a tuft of cotton wool moistened with methylated spirit will do this. It is best to work on the film and varnish afterward, as a damp finger will smudge the pigment. Photopake, or blue-black watercolor makes a good solid line. Blue black is easier to use than Indian ink, as it is softer and easier to rub down with water. The ruling pen should be set to make a fine line; if too broad a line is tried the pigment is liable to run out too freely and make "blobs," and sufficient ink should be put into the pen to complete each line at one stroke, as it is difficult to keep the line straight and unbroken if it cannot be drawn at one stroke. Some people recommend strips of paper gummed on instead of ruling a line of pigment, but it is not a good plan, as it is almost impossible to get the damp paper laid on quite straight, especially if the negative is large; another reason for avoiding paper strips is that at the corners there are two thicknesses of paper, and this is quite sufficient to prevent the printing paper being pressed into contact at the corners, and as the artist's signature is often in the corner, it may be quite blurred in the print. This want of contact will be very evident if extra thick printing paper is used.—*B. J.*

Copying Photographs

An up-to-date photographer is an all-round man. If he would achieve success he must be ready to take up any business that comes his way. Ready, too, to *make* the business come his way. Every-day portraiture is and will remain the staple and backbone of all business, but the sidelines are usually added lines—as much "found money" to swell the net profit. Sidelines often make the difference between loss and gain. The stockyards of Chicago (when beef sells at normal) make their margins out of what is waste to a village butcher. The motor "busses" which dash along the streets of London return handsome dividends to their owners, but the receipts from the advertisements which are pasted over the busses pay every dollar of those dividends. The value of a specialty has been repeatedly, and wisely, urged and the specialty is not, usually, a leading line—in point of production—but a line which produces *extra* money.

One of the soundest sidelines in connection with photography is copying. There is an old theory abroad, especially with the country photographer, that copying is hard work. At least it is careful work. But no man is likely to succeed in photography unless he has, at the least, a capacity for taking pains. And beyond a moderate amount of painstaking there is no especial difficulty. Copying should be as much in evidence as enlargement. There is one phase of copying which is too frequently lost sight of; the old-time pictures are very often in the hands of people who possess money. The old daguerreotypes and ambrotypes figure on many a wealthy mantel; and copying should by no means be relegated to the limbo of tintype.

If copying is carefully done the copy is usually a manifest improvement on the original—the customer can see the difference. The faded yellow of an old-time "silver print" is not in the reproduction, and the latter looks pluckier and more vigorous than its original.

Perhaps no reproduction is more beautiful than one from a daguerreotype. The grainless delicacy of the original yields a print without any trace of that mealiness so apparent in many reproductions from paper prints. At the same time, the best results are obtained only by great care and delicacy in handling. The first act with many would-be copiers is to "restore" the original; it should be the last thing thought of, except in case of absolute necessity. Sometimes a daguerreotype is tarnished over its entire surface, and in such a case the customer may elect to risk its restoration. There is no real difficulty in this, but if a mistake is made it is usually fatal. Although so permanent, the silver film is exceedingly delicate, and must not be fingered. Dust it very lightly with a soft camel's-hair mop, and hold it by one corner with a pair of pliers. The clearing solution is a weak potassium cyanide one; 3 per cent. is a suitable strength. Rinse the plate, held by the pliers, in running water; and while wet flow it with the weak cyanide solution. Let this flow over the plate, and then drain it back into its bottle or graduate. Do this several times, until the stain disappears and the picture appears as clear and brilliant as ever. As soon as this point is reached wash well in running water, and then at once, before the water collects into drops, dry the plate over a spirit lamp, the heat being applied to the back. The plate should be held slopingly, and to dry first at its upper corner. There must be no hitch in the drying; the water must steam steadily off, or the plate will show a mark. And if the heating is too slow there is a risk of the silver film shelling from its support. *Pure* water is often urged in photography; in daguerreotype restoration it is very necessary. As soon as the picture is dry it should be restored to its case, and sealed around the edges with well-pressed down gummed paper to exclude air. It may again be emphasized that restoration should be only a last resort. Even when the plate is tarnished it is often better to attempt copying before trying to restore the picture. In copying daguerreotypes the reflection difficulty will probably occur. It can best be got rid of by a black tunnel, reaching from the camera almost to the portrait; or the tunnel may resolve itself into a box, dead black, or velvet lined, with the plate against the end, and the light admitted through holes in the sides of the box. In all copying work the camera should be covered by a black cloth, with a hole just large enough to let the lens peep through.

Perhaps the fundamental mistake in copying, particularly in copying daguerreotypes, is overexposure. This does *not* mean underexposure; but give a generous exposure and develop for the lights. Don't kill these in an attempt to extract all the detail from the shadows, or flat prints will result. Develop for the lights, and the shadows will usually turn up satisfactory.

Glass positives or tintypes are subject to the same rules as the daguerreotype, except in the matter or manner of their delicacy. The old glass "positive" or ambrotype is really a weak, thin negative, backed up by some black material which, showing through the clear glass of the shadows, reverses the nature of the print. Where the black is partly worn off a new coating should be given, or a piece of black velvet may be pressed against the back of the picture. Never attempt to clean the black varnish from an ambrotype without first being quite sure that it is not coated on the film side, as is often the case. If the print was in the beginning backed with black velvet, instead of varnish, it may be used as a very thin negative and a direct print obtained. Retouching negative copies is usually a mistake; a reproduction from an old-time photograph should retain all the old quaintness of the original. To transform it into twentieth century work is not only vandalism, but is also rank bad business.

The copying of paper prints is in some ways easier than the copying of earlier kinds of work. The usual troubles to contend with are fading and yellowing. An ordinary plate is better than an orthochromatic one, unless the photographer understands these and when to use them. The yellowness may be counteracted by placing a blue screen in front of the print. What part of it has faded away is beyond the reach of any camera, but a print from a correctly made negative will be more vigorous and without the faded suggestion of the original.

I have not touched on the working-up of the paper print. The general advice "don't" is good advice. But where they are to be worked up they fall to the spotter, who must beware of doing too much. And where possible it is better to work on the resultant print rather than on the original.

Copies, like portraits of today, give scope for the exercise of taste in trimming and mounting. In the original, mounting as we understand it today is non-existent; and it is more than probable that the spacing can be improved by the trimming knife. These are perfectly legitimate points, and are worth careful consideration.

A few copies, preferably enlarged, and *with* their originals, should be in every reception-room. They will advertise themselves and draw business. The copy will look well on a broad, white, tinted center mount, in a simple wood frame, very plain and narrow and probably light in tint; the original photograph close to the frame in one of the lower corners.

Stage Folk and the Studio

A GENERAL idea is undoubtedly prevalent that the photographing of "professionals," *i. e.*, stage people, is one of the easiest things that fall to the lot of the studio worker. Admittedly their artistic culture and temperament, their *bonhomie*, their ofttimes charming features and strongly marked individualism help to inspire in the operator a high ideal of his work and make it an undoubted pleasure to him. But the mere fact of a person assuming expressions in the studio that he or she has by long practice identified with character on the stage is not sufficient. The same applies to pose generally.

The conditions under which they are seen on the stage and before the studio camera being so vastly different, and the idea being to convey that stage atmosphere, we have to consider what means to adopt, what to emphasize, and what to reduce to gain the required result. Facial expression, exaggerated on the stage to convey its meaning to possibly a vast audience, becomes more or less grotesque repeated in the studio.

The advantage of making oneself acquainted with the "character," and of seeing its portrayal on the stage if possible, is very obvious. Fortunately the ladies and gentlemen of the "profession" are very helpful people; no trouble is too much for them; they do not become irritated by long sittings—often very necessary—and are pleased to place themselves entirely in your hands.

Make-up for the camera portrait is an art in itself; color generally should be "taboo," all possible facial lines should be produced naturally, and if it is then seen that certain lines require accentuating, do this with the "pencil" under the lighting conditions that will appertain when exposure is made. Avoid a "mask-like" face of all things—animation of expression should be maintained, even to the movement of the eyes, so avoiding that unblinking stare that mars, so often, otherwise good work. Seldom be satisfied with one lighting effect only for a study in expression; a change of lighting may often bring out the more salient effects, truer to the character portrayed.

When the lighting is arranged to one's satisfaction, then study, as before said, whether improvement can still be made by a touch of "pencil" or powder—a shadow deepened, a high-light "picked up."

Finally, get your sitters to "work," to visualize and express the character—even to repeating some of their lines—to work up to the moment of its highest emotional point, and then—and this is where your stage people help you so much—to hold themselves for that second to enable you to secure a picture that shall be convincing and human.

The subtlety of expression, subdued but still convincing, is what should be aimed at. With "pose," again, one will often find quite a degree of nervousness and uncertainty in the sitter if asked to "work," say, from right to left, instead of from left to right, the latter having been the stage position.

A very well-known and charming comedy actress found the greatest difficulty in "working" from the opposite side of a table to the one she had been used to, the change being advisable for various reasons.

Quality of technic is called for in a very high degree in this class of work; Press reproduction has to be considered, and the vitality and arresting power of a stage portrait always kept in view as its most valuable asset.—*B. J.*

VIEWS AND REVIEWS

Distributing the Christmas Rush

The approach of Christmas means to the enterprising photographer a harvest of good business, but in many cases it also means a strain. The season is short, and as the day grows nearer the demands of customers become increasingly insistent for the completion of orders in less time than should be devoted to them—all of which means wear and tear upon the nerves, increased overhead expense, and generally the disappointment of some patrons.

By forseeing and providing for this situation, many photographers have found it possible to relieve the strain to a considerable extent. Advertising in the local papers for early sittings will often accomplish much, if the right touch is given to the "copy." The larger convenience in making an appointment, the sitter's greater repose of manner before the rush, avoidance of haste in decision on the proofs, the possibility of getting the pictures in plenty of time to send away to relatives and friends, and the patron's greater satisfaction in having this Christmas matter attended to a little time ahead—these are all ideas that can be judiciously used, both in general advertising and in letters of solicitation which are coming more and more into use to create new business.

To clinch the matter, some photographers also offer inducements for early sittings. The best plan for this that we know of is, first, to establish a new style for the holiday trade, and then offer a reduction on it for sittings made before a certain date—say December 10. The style may not happen to be the one selected, and the opportunity to obtain a reduction may not appeal to all patrons, but the offer has pulling power even in such cases, as it suggests that the photographer actually expects more business than he can handle after the advertised date.—*Portrait.*

Exhibit from Alexander Keighley, F.R.P.S.

An exhibit of fifty-four large examples of the work of Alexander Keighley, F.R.P.S., of Steeton, near Keighley, England, has arrived from abroad to be shown at The Camera Club, 121 West Sixty-eighth Street, New York, free of charge, beginning October 15. Mr. Keighley is a member of the London Salon, as well as a Fellow of the Royal, and he is one of the best known and most skilful landscapes pictorialists in the world. The inhibition will continue for six weeks from the above date, and no one who can attend should fail to do so.

The Fundamentals of Photography

There has long been a need for an authoritative hand-book putting forth the theory of photography in the simplest possible language, and this little book by Dr. Mees will be welcomed by many readers. The author tells us that "this book has been written with the object of providing an elementary account of the theoretical foundations of photography in language which can be followed by readers without any specialized scientific training." There are numerous diagrams and illustrations which aid the text. This book is published by the Eastman Kodak Company, Rochester, N. Y., at $1.00, and we recommend it to anyone who wants to understand, clearly and rightly, the fundamentals of photography.

Photography: Its Principles and Applications

By Alfred Watkins, F.R.P.S. Illustrated. New York: D. Van Nostrand Company, 1920. 2d Edition. Price, $3.00 net.

Mr. Watkins speaks with considerable authority on the principles and applications of photography. Few men have devoted so much study to the one and time to the other. For his work on exposure and development he was awarded the Progress Medal of the Royal Photographic Society of Great Britain, which is the highest endorsement possible. As the inventor of the Watkins exposure meter and originator of the Watkins factorial system of development, Mr. Watkins is fully equipped to write a most instructive book on these subjects, and the volume before us is a thoroughly practical and comprehensive text-book on photography. Not its least interesting feature is its originality. There are chapters on First Principles; Lenses; Exposure Influences; Practical Exposure; Development Influences; Practical Development; Camera and Dark Room; Orthochromatic Photography; Printing Processes; Hand Camera Work; Enlarging and Lantern-slide Making; Color Photography; General Applications; Record Applications; Science Applications; Plate Speed Testing; Process Work, and an Addenda on Pinhole Photography. A new method of speed testing is given at the end of the book and is of considerable interest. It is a modification of the Hurter and Driffield method, giving the center of the correct exposure period known as the point of double flexure. It is a book that we strongly recommend to our readers to read, mark, learn, and inwardly digest.

The Air-Brush in Photography

The Air-Brush in Photography. 143 pages, 45 illustrations. Bound in cloth. $3.50 postpaid.

The most comprehensive work ever written on work with the air-brush, especially as applied to portrait photography, working up enlargements, etc.

Mr. George F. Stine, the author, is known as one of the most expert workers with the air-brush in this country, and the series of thirty-two illustrated lessons, which forms a considerable portion of Part One of the book, is the most detailed and most carefully worked-out course of instruction that could be imagined. With the help of this book any photographer can learn to use the air-brush in his studio.

In addition to the comprehensive series of lessons, there are seven chapters on coloring with the air-brush, a very valuable addition to the book, and something heretofore not found in print.

Clarence H. White School of Photography

Clarence H. White School of Photography announces the opening of the seventh winter session, October 11th, at 460 West 144th Street, in the new building devoted exclusively to the purposes of the school. Opportunity is now given for the development of courses of photography and the allied arts heretofore impossible. Students can enter for full course of instruction of thirty weeks any time before December 1st. Evening and special classes are now being formed. New catalogue is in preparation. For information address, Lewis F. White, Secretary, 460 West 144th Street, New York. Telephone. Audubon 3272.

More about Soft-Focus Lenses

Rochester, N. Y., October 26, 1920.

Editor Photographic Journal of America.

Dear Sir: I read with interest the article by "Flambeau" in the September, 1920, issue of your magazine, entitled, "Soft-focus Lenses—their Use and Abuse." The writer evidences not only a thorough knowledge of soft-focus lenses, but also of the principles of art as applied to their correct usage.

There are, however, a couple of minor points to which I would like to take exception. Flambeau has evidently not used the latest-type Verito, which we developed within the last four of five months; for he tells us that there is no soft-focus lens which in the longer focal lengths can be operated at a better aperture than *f*/8. Our 14½-inch and 18-inch Verito (as well as some of the shorter focal lengths) have a speed of *f*/4. While very few photographers employ this largest aperture, the big majority of them find that it is not necessary to stop down to smaller than *f*/6 in order to get a very delightful quality of diffusion. In fact, *f*/6 seems to be the aperture most generally preferred, although where greater or less diffusion is required a larger or smaller aperture would be necessary.

To illustrate the quality of work that the Verito renders at an aperture as large as *f*/6, I am sending you under separate cover a reproduction of a photograph made in a demonstration by Bill Towles, of Washington, D.C. The portrait shows a beautifully soft quality that is not too extreme, and at the same time as sharp as any one could desire for such a type of portrait. Demonstrating at practically all of the photographic conventions during the past year, Mr. Towles has shown the capabilities of the Verito lens in the hands of a skilful worker and when correctly manipulated.

Flambeau also tells us that a soft-focus lens will not render sharp results. This is generally true, especially when working at large apertures. However, in the case of a Verito, one has an instrument that is absolutely controllable, and the quality of softness can be varied to suit the individual preference of the operator. The more the lens is stopped down, the sharper the results it turns out. In fact, the writer has seen pictures made at about *f*/16 or *f*/22 that were comparable in quality to those rendered by an anastigmat. Controllability is essential in a soft-focus lens, for it is obvious that for some types of pictorial work greater diffusion would be desired than in others.

Of course, success in the use of the Verito, as in the case of other soft-focus lenses, rests very largely with the man behind the gun. Flambeau commends the excellent work of Garo, who, in the use of the Verito, has given to the world photographs that compare most favorably in quality with the work of brush and crayon. The fact that skilled artists, like Garo, Goldensky, Frank Scott Clark, William Shewell Ellis, Will Towles, Edward Weston, and numerous others of like renown, select and use the Verito for their work, is pretty good evidence that there is at least one good soft-focus lens on the market, working at a larger aperture than *f*/8, that will turn out a quality of results entirely in keeping with the requirements of art and photography.

Cordially yours,

M. C. Williamson.

For the Wollensak Optical Company.

Interference Color Photography

An abridgment of what appears to be a remarkable patent specification is published, before acceptance, in the current *Patents Journal*, in accordance with the International Convention. The inventor is P. Elmassian, 13 Rue Jules Cesar, Paris, whose British application receives the series number 141,699. In the interference method of color photography, the radio activity of the mercury, silver, or other radio-active material used in conjunction with the film is supplemented "instantaneously and simultaneously with the eruption of the rays reflected by the object in the form of electricity, *x*-rays, light, or other form of free energy, so as to make up for the normal insufficiency of the radio-activity of these substances made by radiation in the opposite direction from these latter to aid, on the one hand, the extra rapid realization of the equilibrium of the stationary rays, the remainder of the available energy serving to effect the laminar formation of the different complementary colorations corresponding to the rays absorbed by the object, and, on the other hand, to aid in the prompt formation of the blacks by the process of superposition of unilateral rays in the region of the sensitive film where no ray comes from the object.

The Lippmann Process

The French Photographic Society, in whose proceedings color photography figures rather prominently, chiefly as *seances de projection*, recently witnessed a demonstration of the Lippmann process by M. de Watteville, who used a special mirror apparatus on his own design. Another member of the Society, M. Jové, has recently shown a series of beautiful Autochromes made on plates hyper-sensitized according to a method of his own.

A Patented Screen-plate Process

According to the French patent of E. Cervenka, a negative is made in the first instance on a panchromatic plate through a three-color mosaic filter. A positive transparency is printed from this negative and placed on a second mosaic filter corresponding exactly with the first, but with colors of much greater intensity and thinly coated with bichromated gelatin. The plate is then exposed to light and washed to remove the unaltered gelatin. The unprotected portions are then bleached with a solution of stannous chloride, leaving an image in the correct colors on the plate, which is then backed up with white paper. The use of a bleaching bath may be avoided by using a three-color mosaic on transfer paper. The unexposed parts are then removed simply by washing. On then placing the plate in contact with the negative and treating with anethol, the colors are bleached out directly in light.

Truthful Color Rendering

The average photographer is, I think, inclined to be somewhat conservative and loth to change from the customary practice. Further than that, like everyone else who has practised photography, he has become so saturated with the totally erroneous color-rendering of the ordinary plate that he is inclined to consider a really truthful rendering as false.

If we compare the sensitiveness of the eye with that of the ordinary plate, the falseness of the color-rendering becomes at once apparent. The plate sees nothing but ultraviolet, violet and blue; the eye practically nothing but blue, green, yellow and red, with yellow as the brightest color; that is to say, those colors which are visually bright appear black to the ordinary plate.

No one who makes a real trial of panchromatic plates will ever go back to the ordinary or even to the isochromatic. Only the color worker knows how much red there is actually in nature. It is true that one does not always want the extra red sensitiveness, and while one need not always take advantage of it, it is just as well to have it as a reserve force—it is like a balance at the bank, always handy.—E. J. Wall, F.R.P.S.

The Color Portrait

In an article in the *Camera*, reviewing the work of Mr. F. E. Ives, Mr. C. H. Claudy sums up the present position of color processes for portraiture in the following altogether commonsense judgment: From a time before the memory of the oldest living follower of Daguerre, professional makers of portraits have confessed their inability to hit perfection in one try and have always made several negatives at a sitting, giving the sitter the choice. To do so with color photography by any process available would be simply ruinous in expense, and those professionals who tried have found that Mrs. Astorbilt was pleased enough with her single color picture, but always wanted to wear another necklace or have the train draped on the other side or would have a little more or a little less rouge—and the photographer could not make many color pictures for the price of one and make a profit, nor succeed in getting enough for the one to make such a course pay.

So the photographic world waits. We know from the perfection of the half-tone color process that colors can be put together *via* the camera and produce colored pictures on paper. We know from the laboratory that it can be done even by amateurs, if they will take the time and effort to learn how. From such a state of the art to commercial possibility, fool-proofness and everyday success is but a step. It may be a long, long step or a very short one. We cannot tell until we take it. Meanwhile, the very easiest way to get a photograph in colors is to make a good one on plain paper and take it to an artist to decorate with brush and pigment.

Death of William H. Rau

Just as we go to press we are shocked and saddened to learn of the sudden death of William H. Rau, of Philadelphia, on November 19, at the age of sixty-five. He was well known and esteemed by the professional fraternity and was closely associated with Edward L. Wilson in his early career. A full account will be published in next month's Journal.

AMONG THE SOCIETIES

Photographers of Southeast Organize Association

The Southeastern Photographers' Association was organized with a membership of nearly 200 members, representing seven States, at a meeting held October 13, in Atlanta, Ga. Thurston Hatcher, of Atlanta, was elected president, and a membership drive is to be started at once. The Association's territory comprises Georgia, Alabama, Florida, North and South Carolina, Tennessee and Mississippi. A committee composed of the officers of the Association was appointed to arrange for the membership drive and to draft a constitution and by-laws.

Officers were elected as follows: Thurston Hatcher, president; J. C. Deane, Rome, Ga., secretary; W. R. Abbott, of Opelika, Ala., treasurer.

Vice-presidents were chosen from the different States as follows: Georgia, John B. McCollum, Columbus; Alabama, Stanley Paulger, Montgomery; South Carolina, H. Bernhardt, Spartanburg; Florida, Al P. Burgert, Tampa; North Carolina, J. E. Alexander, Salisbury; Tennessee, Joe Knaffl, Knoxville; Mississippi, J. E. Hoffmeister, Columbus.

The New England Convention

The Convention of the Photographers' Association of New England, held in the Auditorium, Springfield, Mass., on September 27 to 30, reminded us much of the conventions of former years, with the manufacturers displaying the newest goods in their line and the members meeting like a large family.

As no stenographic notes were made of the lectures and demonstrations, we can only give a short synopsis.

A. K. Peterson, of Hartford, Conn., was elected president; Louis Oliver, of Providence, R. I., first vice-president; Earl G. Mills, of Providence, R. I., second vice-president; E. A. Holton, of Boston, treasurer, and Perry B. Kenyon, of New London, Conn., secretary. The following state vice-presidents were then elected: For Maine, Harry Allen, of Livermore Falls; for New Hampshire, H. C. Cutler, of Keene; for Vermont, C. E. Shorey, of Brattleboro; for Massachusetts, Eric Stahlberg, of Northampton; for Rhode Island, Charles Clarkson, of Newport, and for Connecticut, L. G. Gerry, of Willimantic.

The next place of meeting was left to the selection of the incoming board.

J. H. Garo, of Boston, had the distinction of winning three salon honors with a portrait, a still life and a landscape. Other winners, to each of whom was awarded a single honor, were M. D. Hanson, of Portland, Maine; W. C. Noetzel, of Newton Center, Mass.; W. H. Manahan, Jr., of Hillsboro, N. H.; Nils Ekman, of Bridgeport, Conn., and F. E. Geisler, of New York.

The annual dues were increased from $3 to $5 per year; studio employees, $2 per year.

Gerard H. Thayer delivered an illustrated lecture on "Camouflage in Nature and in War." He told of the study of camouflage in Nature as pursued by natural historians before the war, illustrating his discourse with many stereopticon views of insects, tree toads, partridges, leopards and other wild creatures with protective coloring. He then told how, at the debut of the war, the art of military camouflage was evolved from the researches of natural scientists and natural historians and showed several slides of its practical application.

Artificial lighting demonstrations were by T. E. Halldorson, using the Halldorson Flash Cabinet; I. Buxbaum, of New York, using the Brieloff Studio Lamps; Will H. Towles, using the Butler-Sanker lamp; L. J. Buckley, with the New Buckley Light, and a special demonstration of the improved Johnson Ventlite.

The lecture, "Coöperative Advertising" by J. C. Abel, and that of Ernest L. Major, on "Art as Applied to Photography," were right to the point and proved of great interest.—*Bulletin of Photography.*

Ohio Photographers

Members of the Photographic Society of Ohio, which has for its object the interest and advancement of art for art's sake, began a two-days' session at J. A. Bill's studio, Cincinnati, on October 11. W. H. Towles, Washington, D. C., authority on light and shade, gave a demonstration following the meeting.

G. C. Kehres, Cleveland, retiring president, said that sunlight was no longer necessary for studios. He said artificial light had been improved to such an extent that a studio could be conducted as well in a cellar as on a top floor. In discussing the advanced cost of photographic material, Mr. Kehres said that photographers had not taken advantage of the increase, and that there is to be little if any change in prices, though costs still are advancing.

Officers elected were president, Walter McKeown, Marion; vice-president, Frederick Bill, Cleveland; secretary and treasurer, Vinton Herron, Ashtabula.

English Photographic Art

Alexander Keighley, F.R.P.S., of Steeton, York, England, member of the London Salon of Photography, is giving, by invitation, a one-man show of his work at The Camera Club, New York, which opened October 15 and will continue until December 15, 1920. This exhibit consists of fifty-four examples in sizes from 12 x 15 to 24 x 30.

Mr. Keighley ranks abroad as one of the foremost pictorialists and, in his specialty of landscape, mostly with figures, he is unsurpassed by any worker in the world. His motives are rich in atmosphere, mood, sentiment, light in its variations, values and subtilties. His renderings are broad, suggestive, illusive rather than obvious. There has never been a collection of photographic landscapes in this country, according to some of the art critics of our metropolitan journals and many old-time pictorialists, that could excel that which Mr. Keighley has been so kind as to send to The Camera Club for its study and admiration and the delight and instruction of the public.

A description of some of his pictures and his treatment may be of interest to many who cannot attend his exhibition and enable them to form some idea of them and the results he has achieved.

"The Witches' Pool" presents a "deep, tangled wildwood," with a pool filled with the semblance of reflections. In the recesses of the glen is discerned a "witch," dressed in traditional garb, with a staff (or perhaps it is a broom), indistinct and fanciful like a phantom. The scene is printed in dark green carbon, which helps the weird aspect; and the picture is altogether "spooky" in expression.

"The Market Boat" is finely balanced both in line and mass; the water is beautifully rendered; the foreground objects clear, the distance in subduction and very atmospheric. The shape is narrow, the dark market-boat in the near forespace contributes cleverly to sending back the distance to an unusual extent. It is delightful in tonal differentiations.

"The Lawn" reveals a tree-trunk against which is a settee; in front of this is a lady and a child, both in white and standing; beside them a dog lies sleeping and the whole group is effectively posed against dark tree masses across the lawn. To complete, there is a peacock used as a balancing point, and placed so naturally that the act conceals the art.

"The City Gate" is a decoration remarkable for its sunlight effect, tonal quality and composition. An interesting group of village gossips is faultlessly arranged, one of them apart balancing the rest, and these are in tasteful apposition to a dark belfry relieved by a light cloud.

"Grace before Meat" is like an Israel—masses contrasting in that artist's style of splendors instead of the more modern values; delightful in breadth, happy in sentiment, excellently spaced and altogether a masterpiece depicting homely surroundings and humble piety.

"Moonrise"—the orb just emerging above the treetops; a splash of foreground light, suggesting reflections in the forefront brook, and all the rest—mystery! This picture is very convincing and has every appearance of being a real moonrise rather than one of the many daylight "fakes."

"Storm Clearing Off" is a subject success among other successes in its line which we have seen in painting and photography, and many failures in both. It would be difficult to surpass it in any medium. The long, dark foreground, with two trees silhouetted against a clearing sky, balancing the picture, and then the distance—and such a distance!—the sun peering in and out of darker masses and "drawing water," with beams and streams of light and dark; and joined to these is a great expanse of silence and solitude!

"Egyptian Potters" renders very strongly types of Orientals, their trade and product; is perfect in grouping, forceful in lighting, and is a picture one can admire continually for its artistic as well as its scenic interest.

"Lime Kilns at Cairo" is most enjoyable in subject, toneful in representation and masterful in the way the figure of a man ascending to the kilns and carrying a basket of lime is made to balance the whole of the large space and the triumphantly depicted distance.

"The Harp of the Winds" (not after Homer Martin) is a splendid interpretation of trees against a most remarkable sky, the whole beautified by a flock of sheep with a shepherd in a screen of dust their march has raised. A feeling of deep quietude pervades the scene.

"Beside Still Waters" composes a brook and palm trees, and along its bank two female figures, one leading, the other driving a cow; the lighting soft and subdued, which causes a sense of dreamy stillness to steal in upon the beholder.

"The Melon Stall" features a picturesque group of three boys, a man and a woman, repeated by another smaller group in a doorway. The light in this picture fairly gleams and vibrates through the whole scene in dazzling brilliance. It is one of the finest representations of bright sunlight I have ever seen.

"Under the Greenwood Tree" shows a hillside with a detached trunk and an umbrageous tree with two figures seated in its shade; there is a declivity extending gradually to a river, the cast shadows from the trees forming a fine design. All this against a distance in a softened, tender light that greatly fascinates. This is a tonal gem.

"A Picardy Pastoral" affords a view of a scene embracing another flock of sheep, in the midst of the dust their feet have liberated, these driven by a shepherd, and all suggested instead of represented, massed rather than individually identified. The picture is most satisfying.

"A Spring Idyll" includes a man and a girl seated on a knoll under a denuded tree beside a brook. They and the foreground are distinct, then are seen receding planes, atmosphere, diffused light; and stillness is felt, to which the lines delightfully contribute.

"The Stray Lamb" is seen

"Out on the mountain cold and bare,
Away from the tender shepherd's care,"

and is one of the best compositions in Mr. Keighley's collection. It is simply perfect, with lovely contours and undulations in succession in a mountainous region; and in this setting, like a diamond that sparkles and delights by its beauty, is seen a solitary, isolated lamb, in affrighted pose. It is placed just where it is most conspicuous. A feeling of great loneliness and dreariness enhances the feeling of pity awakened by this masterpiece.

"The Cliff" is one of the finest pictures in the exhibit. There is seen a foreground group consisting of trees, an old, quaintly dressed woman with a staff and a small flock; and this group increases the illusion of great height of the cliffs, towering in misty splendor above the valley pasture. Broad sunlight covers the cliffs in diffused radiance.

"The Moving Flock" is masterful. Two sheep, half out of the picture, followed closely by two others, then a space, with a following flock driven by a man mounted and another on foot; two sheep on one side, which have strayed, hastening to join their fellows; dust floating in the air; the background in subordination—these all serve to make the beholder feel the movement of the flock; and the picture is in all other respects charming and complete.

"Harvest Home" delights again by its art and interest. The group of farmhands, man and woman, with a team of white oxen and a load of hay or grain; a hillside surmounted by an edifice, joined to a fascinating distance that has faded away in dreamy light; and then at one side, correctly balancing the picture, one of the "hands" is seen coming along a road, carrying his tools and coat. The team, etc., have seemingly been driven slightly to one side of the roadway to permit this disposition of the figures in producing the desired object. Then one feels the dimness of fading, evening light in which all are hastening homeward.

"Harvest of the Hillside" is likewise a farm scene, similar yet different in conception, action and effect. What arrests in this picture is the atmosphere which envelopes the whole scene and every object.

"Water Carriers" is a motive quite Oriental with its women water carriers, which lacks nothing in design, tone or sentiment, and charms by suggestion rather than statement, for the treatment is broad. The distance is particularly effective.

"The Village Street" is more impressionistic than most of Mr. Keighley's other pictures; and the oxen and men lend an interest while the light masses contrast and delight.

"The Shepherdess" is a very effective figure study of foreground prominence and background subordination, depicting industrious employment with watchful waiting.

"Peace" exhibits another flock of sheep and an old woman attendant (or is it the same?). The flock is in sunlight which gilds the backs of some of the sheep while others are thrown in shade. In the background is an old castle gateway, possibly the remains of war or time. The atmosphere in this example encompasses every thing, throwing the ruin in misty recession and the distance in dim obscurity. This is one of the finest specimens of photographic art I have ever seen.

"The Terrace" shows a lounging group of rustics underneath an extensive row of trees in rhythmic succession, through which one overlooks hills and valleys enshrouded by clouds which stoop to enfold the meadows, and a meandering road or river only suggested in the flickering light.

"A Pilgrimage to Mont St. Michel" is a decorative landscape of beautiful pattern and exquisite lines, the whole blazing with sunshine, through which numerous pilgrims are seen wending their way up a winding staircase to the interior of a cathedral—which was once a castle and a fortress, and now abounds in tradition and legendary.

"The Angler" would be difficult to excel in simplicity of treatment, mystery and poetic beauty; is also arresting by reason of its textures, masses and fading light.

"The Pool in the Wood," while splendid in its rendering of water and reflections, is striking for the clump of birches, from which is emitted silvery sunlight which scintillates and dazzles with beauty and truthfulness.

"The Sheik's Tomb" is of great scenic interest, the tomb outstanding as a monument and excellent in its pattern; and the surrounding figures a study in types.

"Larch and Mountain" depicts a flock of sheep driven by a shepherd, with a large group of larch on one side, balanced by a smaller one on the other, all these filling the foreground space; while beyond, and through the encasement, is seen a mountain in a blaze of sunlight and a pillar of cloud, the effect entrancing, wonderful!

"A Swiss Landscape" presents a solitary tree for a balancing spot, growing out of a stream in the foreground, the receding hills and mountains resplendent in circumambient air!

"Distaff and Spindle" is a genre of unusual excellence, the story well told, the setting graduated in exquisite values in a scale that runs from dark to almost white. The figure and the employment are most successfully depicted.

"Early Morning"—a village awakening out of sleep; smoke issuing from some of the chimneys, ascending and slightly obscuring the housetops which, overlooking, one beholds a river, a bridge and a distance, all shrouded by the lingering dawn and shadowy vapor.

"An Italian Landscape" is a picture rich in tone—for there is one prevailing tint to which all other hues are subordinated—with accents of light on some buildings and a bridge, and a few dark spots of trees and shadows. A winding road leads to a spacious distance, and in it, surmounting an eminence, is seen a castle, all melting into perfect aërial perspective and producing an expression of profound repose.

"The Bridge" is a delightful space arrangement, with splashes of radiant sunlight, in splendid gradations; four women, one carrying a child, crossing the bridge; three boys reclining in the foreground, in oppositional balance to a man on the farther side of the structure. This scene is full of action and interest.

"The Campanile," with the lofty tower in the distance penetrating a sky of billowy clouds; the forespace filled by a quaint building on either side of a court; quite a number of the denizens of the quarter seated on a walk before their doors, and a day's washing hanging on a clothes-line in a yard in the rear and, finally, some pigeons picking and feeding in the forefront. A circular opening, left when the structure was built, affords an exit to that portion of the town in which the campanile is located. Harmony of tones, subtleties, vibrating light prevail and serve to make this picture most attractive.

"Corpus Christi"—this *Fête Dieu* is being celebrated; the procession is descending a cobblestoned stairway, led by a candle-bearer and the officiating and other priests, with incense and, in the background, is seen a canopy and possibly the consecrated host for adoration. This picture is on a narrow mount ($8\frac{1}{2}$ x 28) and is pleasing as a representation of a custom and a rite, delightful as a spectacle and is noteworthy for its lighting, values and harmony of tones.

"Loading the Camels" shows the performance of that occupation in the East, including appropriate characters, the feature being the way the massing is done and the pattern developed.

"The Almshouse Well" is finely composed, full of subdued light, the well and figures conspicuous, while the incident awakens a most pathetic sentiment.

"A Spring Pastoral" is a fine example of artistic photography in the sense of balance, differentiations of planes and soft lighting.

"The Water Cart" features a dark shape, in the depths of which is evidently a well, up to which an ox-team and cart have been backed: while two oxen, detached from the others, serve as an equipoise to the various parts of the picture. A fine, open view of the distance, softened and subdued, with beautiful clouds, complete this fine motive, save the sentiment of quietude that prevails.

"Silver Moonlight" is a harbor view in silvery light, which is reflected in delightful masses and gleams on dark waters, throwing the foreground boat in silhouette while the other craft is disclosed tossing in the moonbeams. Printed in green carbon, it is most impressive and enjoyable.

"The Dayspring from On High" depicts an effect seldom seen in a lifetime. Sunrays just stream down from above, filling the picture space from top to bottom and side to side. This is all disclosed through two trees, blossom-decked, whose shapes are reflected in the brilliant beams. This picture is unique and will repay repeated examination and study.

"The Sphinx" is well known; a postcard of it can be bought for a few cents, and hundreds have photographed it; but never, it is safe to say, has it and the Pyramids been represented with the wonderful atmosphere seen in Mr. Keighley's interpretation. It is tender, poetic, all-pervading! This motive illustrates the difference between a record and a work of art; between a mere photographer and an artist, and how, in the hands of the latter, an ordinary subject may be spiritualized and raised to artistic rank.

"A Fantasy" is notable for a group of maidens in white performing a dance in circular rhythm. Their outlines are softened and they are seen in luminous diffusion and indefinite shape. A dark mass in the foreground unites with successive planes which dissolve away to a distance that melts into obscurity. This is one of our artist's best, and visitors return to it again and again.

All this description gives only a poor idea of this exceptional exhibit. If, as Ruskin says, "The aim of all pictorial art is praise—man's praise of God's work."

—Floyd Vail, F.R.P.S.

The
WORKROOM

CONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

Toning Development Papers
Making and Printing Carbon Tissues for Three-color Printing
Repairing Broken Negatives
Recovering Platinum from Waste Baths
Copying
Processes for the Reversal of a Negative or Positive Image
Why Deposits Come in Photographic Solutions
The Fixation of Gaslight Prints
Reproductions on Bromide Paper
A Method of Correcting Harsh and Halated Negatives
Coloring Lantern Slides
Mounting Big Enlargements
Dry-Plate Don'ts
Photographic Prints on Drawing Paper
Some Things You Should Not Do — and Why
Stripping and Remounting Negatives and Cleaning Off Old Plates
Green Tones on Bromide Prints
Color-sensitiveness of Different Silver Salts

THE WORKROOM

By the Head Operator

Toning Development Papers

A FINISHED bromide or gaslight print may be regarded as consisting of a pure silver image in a pure gelatin film on a pure paper support. Under normal conditions, the color of the image is black, though, as stated in our last article, it may be brown or reddish brown if exposed and developed abnormally.

The image may be toned in a variety of ways, and of so pleasing a nature are the results that toned bromides have assumed a supremely important position. The tone may be produced by sulphurizing (partially) the silver, or by depositing upon the image some insoluble and colored metallic compound. Thus, ferric ferrocyanide is blue, and by causing a deposit of this compound upon the image we get a blue picture. Copper ferrocyanide is reddish brown, and by depositing it upon the image we produce a reddish-brown picture.

The hypo-alum toning method, which rests on the formation of a sulphide of silver, is rapidly becoming obsolete, on account of the more recent method known as "sulphur toning." The prints to be toned are first treated to an alum hardening bath, and then allowed to "stew" in a hot solution containing an ounce of hypo and a dram of potash alum in each 9 ounces of water. The temperature of this bath is usually maintained at about 130° F. The toning takes place gradually, but the results are very nice, and much excellent work has been done in this way.

Modern sulphide toning is carried out in two operations. The print is first bleached in a solution of potassium ferricyanide and bromide; there is some doubt as to whether the bromide is really necessary, though it is almost invariably recommended. In our own practice it is never employed, and perfectly satisfactory results are obtained. The silver in the image reduces the ferricyanide to ferrocyanide, *i. e.*, silver ferrocyanide is formed. The print is next well washed, and then placed in a weak solution of ammonium or sodium sulphide (which should, if the latter, be freshly prepared). The image now redevelops and a silver sulphide picture is obtained, which is of a sepia color.

Most of the other toning methods for bromide and gaslight papers depend on the deposition of metallic salts, and for this purpose ferricyanide as an intermediary is most generally used. Uranium, iron, copper, etc., are now commonly employed, the last-named more especially. The print may, if desired, be bleached with the ferricyanide first and then treated with the metallic salt, but it is usual to do the whole thing in one operation. Uranium toning, for example, may be accomplished by immersing the print in the following solution:

Water	4 oz.
Uranium nitrate	16 gr.
Potassium ferricyanide . .	16 gr.
Acetic acid	5 drops

A foxy-red tone results, and the print is then washed until the whites are pure, *i. e.*, free from the stain caused by the ferricyanide. It is hardly necessary to observe that, as such a method as the above is additive, some *intensification of the image* accompanies the toning.

A modified copper toning bath, similar to that associated with Mr. Ferguson's name, is made up thus:

A

Copper sulphate	15 gr.
Potassium citrate	60 gr.
Water	5 oz.

B

Potassium ferricyanide . .	12 gr.
Potassium citrate	60 gr.
Water	5 oz.

Equal parts of A and B are taken for use, and the print toned until sufficiently red.

The following bath gives violet tones:

Copper sulphate	15 gr.
Rochelle salt	150 gr.
Potassium ferricyanide . .	7.5 gr.
Water	3½ oz.

Neither of the above methods appears to completely insure all the silver ferrocyanide formed giving place to copper ferrocyanide; toning is therefore imperfect. Prof. Namias suggests giving the prints a second treatment in a bath containing 20 grains of salt (NaCl) and 50 of copper sulphate in 4 ounces of water, and acidulated with about 10 drops of hydrochloric acid. This, within five minutes, completes the precipitation of copper ferrocyanide, and the silver chloride which is formed as a necessary consequence is removed by treatment in a weak hypo bath.

Blue tones are obtained with a mixture of equal parts of two 10 per cent. solutions of ammonio-citrate of iron and potassium ferricyanide diluted with five times the bulk of 1 per cent. acetic acid solution. Green tones are obtainable with Winthrope Somerville's vanadium bath, and so on.

The mounting of all kinds of photographic prints deserves some consideration. A good technician will make it his aim as far as possible to produce a *permanent print.* In order to retain its permanence, the print must be suitably mounted on a card of good quality and with a medium (adhesive) which will not set up any chemical reactions.

All pastes require a preservative; starch and dextrin pastes will become "sour," and will decompose. Molds will only form on the surface of a mountant if it has been left uncovered. Oil of lavender, thymol, carbolic acid, and mercuric chloride are suitable preservatives, the first named being perhaps least efficacious. Boric acid is also used on a large scale. Carbolic acid should be obtained in the form of pure crystals, and about 2 grains dissolved in a little water and mixed with 4 ounces of the mountant.

Glues and gums are usually acid, and their use is not to be recommended.

One important point to remember is that only sufficient mountant—and no more—should be employed. The print will stick most readily with a minimum of mountant, not an excess; if the latter be used, it will be absorbed by the print, and this is the last thing that we want to happen.

It pays to use a thoroughly reliable and well-tried medium, such as Higgins', and to make it go as far as possible.

Making and Printing Carbon Tissues for Three-color Printing

Although there are at the present time several firms who supply carbon tissue in the three colors necessary for natural color printing. I do not think that there are tissues that can be considered as standard colors. By "standard" colors I mean that the amount of color in the pigment has been so adjusted so that all three require the same time to print, etc. After considerable adjustment as regards colors and quantities, I think the following formula can be considered to be near the standard. I myself have obtained quite good results with them.

The first things to prepare are the colors. I use Reeve's powder color, but I should think that colors supplied for artists' use, by any reliable firm, would answer the purpose.

The colors required are: Chrome yellow, alizarine crimson Prussian blue, and ultramarine blue. Three two-ounce bottles are wanted to mix the colors in.

Weigh out:
Chrome yellow, 40 grs. into the first bottle.
Alizarine crimson, 18 grs. into the second bottle.
Prussian blue, 4 grs. }
Ultramarine blue, 6 grs. } into the third bottle.

Before putting the colors into the bottles, make certain that they contain no lumps.

Add to each color 1 ounce of water, a little at a time, well shaking the bottle while doing so. Then put on one side for several hours, giving them a good shaking occasionally.

The emulsion is prepared as follows: Into each of three jars (1 pound stone jam jars answer the purpose) put

Nelson's gelatin	½ oz.
Glycerin	1 drm.
Water	4 oz.

It is best to mix the glycerin well with the water before adding to the gelatin. Let this stand until the gelatin is soft, then add the liquid colors.

Well stir, and then stand the jars in hot water until the gelatin has dissolved, giving a good stir occasionally.

Filter each emulsion through fine muslin to remove any grit, etc. Use clean muslin for each color. After filtering make up the quantity of each to 5 ounces with warm water. The colors can then be put away until they are wanted for coating. Do not keep longer than three days, however, as they do not keep well.

A smooth surface paper is the best support for the pigment, and should be cut about ½ inch larger than you intend the finished plasters to be. The same paper must be used for all three colors in any one batch, as some papers expand more than others, and would prevent proper register.

The cut sheets should be soaked in cold water for at least fifteen minutes, and then squeegeed on to glass. Dry the surface with blotting paper, and then put on a levelled stand. The emulsions should have been heated, so that they are thoroughly liquid, but not too hot. Coat one color at a time, allowing 1 ounce for each half-plate. Pour into the center of the paper and guide it over the surface with the finger. Any air-bubbles that form can be drawn to the edge of the paper in the same way.

If five half-plates are coated immediately after each other the first should be set by the time the last is coated. Pin the plasters to the edge of a shelf in a warm, dry room, where they should dry in about twelve hours. When dry, trim to size, and put them under gentle pressure until wanted. Sensitize in the usual way with potass. bichromate solution, and squeegee on to a waxed ferrotype plate to dry.

One point is important, however, that is, always sensitize a set of colors in the same bath so that all receive the same time of immersion. It is best to mark each set on the back when more than one set is being sensitized.

Printing is carried out in the usual manner as for carbon, the three negatives, of course, being safe-edged. The yellow tissue is put in contact with the negative taken through the blue screen, the red with that taken through the green screen and the blue with that of the red screen. Unlike ordinary carbon, printing can be watched, a faint image being visible on the yellow plaster. Printing should be carried out in weak light, and when examining the yellow, always remove the other two at the same time, so that they do not get longer printing than the yellow.

Printing is complete when all detail in the negative can be seen very faintly on the yellow print. The prints should be soaked for at least ten minutes, and then squeegeed face down on to thin sheets of celluloid that have been previously prepared by waxing with any of the well-known waxing solutions sold for carbon work.

Place under slight pressure for five to ten minutes, and then proceed to develop in hot water. Put all three prints in the same water so that they all get the same temperature during development. The temperature of the water should be between 120° and 130° F.

Develop until the whites are clean and no more color runs off. This can best be seen by holding the print over a sheet of white paper. Rinse in cold water and set to drain. Any good single transfer paper (white) can be used for superimposing the colors. Soak a piece slightly larger than the color print for ten to fifteen minutes, and then bring in contact with the yellow print (under water), well squeegee, and put to dry. When properly dry it should be quite easy to strip the transfer paper with the yellow print from the support.

Clean the surface of the print with a soft rag soaked in benzol, then soak again for several minutes and bring in contact with the blue print. Register the image by moving the paper, and then squeegee. When dry repeat with the red print, and the picture should be complete in natural colors. Instead of the celluloid supports, glass can be used in the same way, but with the glass there is a breaking away of fine detail.

Should it be found that the superimposed colors do not stick it shows that the coating on the transfer paper is not thick enough. This can be remedied by pouring a thin solution of gelatin over the color on the support, and squeegeeing the print on it after soaking. The gelatin solution can be made as follows:

Water	4 oz.
Gelatin	$\frac{1}{4}$ oz.

When all the colors are assembled, if the glossy surface is not wanted, a few minutes' soaking in cold water will give a semi-matt surface.—*B. J.*

Repairing Broken Negatives

WHAT can there be more annoying than to see a cherished negative lying on the floor in pieces, and how often, I wonder, are those pieces confined to the waste bin? Tempers are ruffled, customers disappointed, orders, money, and business lost; yet, with a little manipulation, the effect of a broken negative catastrophe can be overcome. All the necessary materials for overcoming can, or should be found among any photographer's equipment. These materials consist of two or three grades of retouching pencils, a retouching knife or two, and some spare plates of a medium rapidity.

The method of procedure is as follows, and with ordinary skill the damage can be made good.

First retrieve from the floor or other resting place all the pieces of negative, and then carefully piece them together on a clean piece of glass of a size larger than that of the broken negative. For instance, if one is repairing a half-plate negative, then 7 x 5, or even whole-plate, should be used. Having pieced the broken pieces together, next fasten the outer edges securely to the glass bed by narrow strips of adhesive binding—Dennison's lantern slide binding, sold in twelve-yard rolls, will be found admirable for the purpose—taking care that other pieces inside are not moved out of position. Our next step is to make a transparency on a medium speed of plate somewhere about H and D 150—180. Transparency making is not at all a difficult undertaking providing one does not "get the wind up" by using too strong an illuminant for making the exposure. I have made hundreds of transparencies by means of an ordinary match—a wax vesta is ideal. Of course, this method is open to criticism, so there is no hard and fast rule why one should adopt this method, but I give it here as a guide for those who are not used to the making of transparencies. The bound-up negative should be placed in a printing-frame with an unexposed plate in contact with it, film to film. It is a good plan to lay a narrow strip of glass around our bound-up negative in the printing-frame to equalize the pressure when the back is put on and fastened down, thus preventing undue pressure on the center of the frame. Without these strips there is a tendency for the cover to crack, thus adding to one's annoyance by a double catastrophe. Having loaded the frame, stand it end up on the edge of the dark-room bench. Now strike a match, shielding the direct rays from the frame, and when the match is fully alight move it round in a circular motion about six inches away from the frame so as to ensure as even an illumination as possible. Should one part of the negative be denser than another, the match can be held closer to and opposite the particular part for a moment or two longer than the remainder.

Remove the exposed plate from the frame and develop in any non-staining developer, the borax metol-quinol formula being very suitable, as it produces negatives and positives of a very fine grain and free from fog or stain. For those who may not have a copy of the formula by them, I give a copy of it here as published in their handbook:

Water (hot) . . .	20 oz. or	500 c.c.
Borax (powdered) . .	200 gr. or	10 gm.
Metol	20 gr.	1 gm.
Hydroquinone . . .	50 gr.	2.5 gm.
Sodium sulphite . .	200 gr.	10 gm.

Dissolve in the order given, allowing each chemical to be in complete solution before adding the next. This developer keeps, by the way, almost indefinitely in well-stoppered bottles.

When our positive is fully developed, fix and wash in the usual manner.

Of course, our positive will show the cracks and lines of breakage, but it is here where the only skill required will come in, and this with the use of a retoucher's knife and pencil. The pencils I prefer are grades 2 and 3, and for work requiring a good black deposit a No. 1 will be useful. Surgeon's scalpels will be just as useful. The knives most suitable are Nos. 1 and 2, and for fine work a No. 4 is handy to have by you, although a great deal of the work can be done by the first-mentioned grades.

Place the positive on a retouching desk, and with the knife most suitable for the purpose carefully remove the black lines until they are of the same density as the other surrounding parts. This action of reducing the density of these black lines is by the gentle and light process of scraping the film of the positive. On no account should any pressure be used on the knife, otherwise the work will result in a series of rough scratches resulting in an uneven printing density

Take great care not to remove all the gelatin film when scraping, otherwise one will find it very difficult to apply the pencil there afterward if necessary. Having got rid of the black lines, cover the negative with retouching medium and fill and even up the white spaces with the retouching pencil, preferably by means of cross hatching. If the crack has extended across the face, carefully remove the blemish first with knife, finally finishing off with the pencil. When the positive is worked up and retouched to your satisfaction, varnish it with a good hard drying negative varnish. By varnishing a negative, one not only protects the film from further damage, of scratches, etc., the varnish also tends to even up any work that has been done with either the knife or pencil, and makes it less noticeable in the new negative when made.

A new negative is made by repeating the method adopted for making the contact positive —barring the necessity of fastening the same down on a cover-glass. If the knife and pencil work has been carefully done on the positive, our new negative should require very little after work. Should such work be required, repeat the method of treatment of the positive, and, as before, finally varnish.

With a little practice on some old negatives it is surprising what can be done in shorter time than it takes to describe. The whole process is very simple, and an intelligent retoucher can soon convert what appears to be a total loss into an article of value once more.

I might mention here that however carefully the work might have been done, the final negative sometimes looks a little uneven in density owing to the black color of the pencil work printing a different tone to that of the negative in general. For contact work this is not very detrimental, as the print can easily be evened up in the final spotting, but if enlargements are required the handwork may be rather pronounced.

Should enlargements be required, make a print on glossy bromide about half the size of those required, match up some spotting color (to which a little gum water has been added) to the exact tone of the glossy print, and carefully spot same, preferably with the aid of a magnifying glass. When completed, copy in the ordinary way.—Benjamin F. Welch, in *B. J.*

Recovering Platinum from Waste Baths

While silver is falling in price, although still at a level well above its pre-war figure, platinum still remains a material which costs several times as much as in pre-war days, and is subject to great fluctuations of the market. More than ordinary interest, therefore, attaches to the recovery of this latter metal from developers and clearing baths used for platinum paper. We, therefore, take the first opportunity of giving particulars of a new process for the recovery of platinum from these solutions which has been worked out by the Platinotype Company, and is described in a leaflet which has just been issued. We must express our acknowledgement to the company for permission to quote the text of these instructions.

In the presence of the exceedingly high quotation now ruling for platinum metal, the recovery of the platinum content of old developers and clearing solutions becomes an important consideration to users of platinotype papers. To this end it is recommended that these solutions (black and sepia) should be mixed and stored for subsequent treatment by the simple recovery process described below.

The black substance covering the bottom of a dish containing used sepia developer is platinum, and should be added to the stock of residue-liquor for subsequent recovery.

The following hints on clearing can be usefully considered in conjunction with the recovery process:

Use three clearing baths in succession, allowing about five, ten and fifteen minutes' immersion in the first, second, and third baths respectively.

Clearing is, in effect, a washing operation, therefore the slightest discoloration of the third or final bath indicates that it should be renewed.

This is effected in the following manner:

The *first* bath is discarded, and its content thrown into the residue container; the second and third baths are then shifted to the first and second position respectively, and fresh solution is made up for the third or final clearing bath. Working in this way economizes acid, while maintaining the last bath in fresh condition.

Odd pieces and trimmings of sensitized paper should be passed through the acid baths to dissolve out the platinum for subsequent recovery.

It is, perhaps, unnecessary to enlarge upon the advantage of so treating this residue-liquor further than stating that, while a recovery representing a substantial proportion of the original expenditure in respect to the paper used is easily obtainable, the cost of treatment, apart from a small initial outlay, will not exceed 5 per cent. of the value of the platinum recovered.

Briefly described, the recovery process consists in first partially neutralizing the residue-liquor with carbonate of soda solution, then precipitating the platinum by the addition of a solution of hydrazine sulphate, and finally collecting the valuable precipitate by decantation and filtering.

The residue-liquor is conveniently stored and treated in wide-mouthed bottles or earthenware pans of large capacity; these, with a glass funnel of about eight inches diameter and a few suitable filter papers, comprise the necessary equipment.

The soda solution is prepared by dissolving 8 ounces anhydrous sodium carbonate in 50 ounces of warm water.

To prepare the hydrazine solution, dissolve 1 ounce of hydrazine sulphate in 40 ounces of hot (not boiling) water.

This is practically a saturated solution.

First, partially neutralize the residue-liquor by addition of soda solution, the quantity required being one-twentieth of the ascertained volume of the liquor under treatment.

This will be about two-thirds of the full capacity of the vessel employed. A permanent mark, indicating a known capacity, at approximately this level will obviate repeated measuring.

Add the soda solution in small quantities with constant stirring. When thoroughly mixed, slowly add the hydrazine solution, also in the proportion of one part thereof to every twenty parts of the residue-liquor present. Stirring is again necessary when adding the hydrazine solution, and should afterward be repeated two or three times at intervals of half an hour.

After a time the liquor becomes clouded, and a black precipitate of platinum, together with some iron, separates out. The precipitation will be delayed if the temperature of the liquor is much below 60° F.

The bottle or container is now put aside, where it can remain undisturbed for three or four days when the precipitated platinum will have settled to the bottom, leaving the now valueless liquor quite clear, though slightly tinted by the presence of salts of iron.

The greater part of the waste liquor is now finally disposed of by very cautiously pouring or syphoning off, over a sink or drain, as much as possible without losing any of the valuable platinum precipitate. The remaining liquor is now well shaken, and quickly transferred to the filter paper within the funnel, which must be firmly supported to avoid the risk of overturning. When placing the folded filter in position the point should be pressed gently down into the neck of the funnel. A suitable bottle, containing a little water to give it stability, forms a good support, and will prevent loss of the precipitate in the event of the filter tearing. A small quantity of precipitate remaining in the vessel may be left for future recovery, or rinsed into the filter with a little water. The liquid drains away while the filter paper retains the precipitated platinum.

This, of course, will not be in sufficient quantity to warrant its sale; therefore, the filter paper should remain undisturbed for further service, and its contents added to from time to time as fresh batches of residue-liquor are treated.

When a considerable quantity of precipitate has accumulated, stand the funnel in a warm place to dry the contents; when quite dry, wrap the upper part of the filter paper over the precipitate, and transfer the whole to a clean sheet of paper by inverting the funnel.

The platinum precipitate in its wrapping of filter paper may now be securely packed and despatched to the purchaser (one of the concerns dealing in residues), who will make payment after determining its value by assaying a representative portion.

It is a mistake to offer the precipitate for sale in small quantities, the cost of treating these being disproportionately high relatively to their value. Obviously the better practice is to accumulate the precipitate, and despatch the same in larger quantity at longer intervals. A better price will thus be secured, and multiplication of treatment charges avoided.

The present process has been devised expressly with a view to facilitating this practice, and full advantage should be taken of the opportunity thus afforded to realize the largest monetary return for the platinum recovered.

In conclusion, it may be added that the simplicity of this process should appeal to all regular users of platinotype papers.—*B. J.*

Copying

The reproduction of pictures, especially old photographs, miniatures and Daguerreotypes, if properly done, is an important and lucrative branch of the business, especially in studios having a "family" connection. I am sorry to say that all photographers do not think so and therefore do not trouble themselves to do the work properly; as, a consequence the jobs do not turn out well, the photographer does not feel justified in charging a decent price, and the customer is not satisfied. He does not always blame the photographer, but concludes that a satisfactory copy cannot be made, and lets it go at that.

The first mistake that most photographers make is to charge less for a copy than for an ordinary sitting. In my experience a copy takes more time in every process than a sitting, and therefore the charge if anything should be greater, at all events not less. The average operator, whether he be proprietor or employee, usually looks on copies as a nuisance to be knocked off at any slack time and then generally after the time promised for delivery, while any special arrangements for doing the work are in many cases conspicuous by their absence. It is a common thing to find an operator copying a c.d.v. pinned on the edge of a background, using the ordinary studio camera and lens. Copies of a sort can be made this way, some quite good, but there is a great loss of time in getting the proper size and in keeping the print and plate parallel. I have seen many a negative made thus in which the image was badly out of shape, instead of rectangular, and only when the print was trimmed was it presentable.

Much time will be saved and better copies turned out if a special apparatus is kept ready for use, and there are few studios so poorly equipped that a camera cannot be found for this purpose. If a camera cannot be spared, at least a pair of runners and a copying board can be arranged so that the studio camera can be used, and if this is a fixture upon its stand the runners and board can be attached to that, in the very simple way invented many years ago by Mr. A. Cowan.

But the copying apparatus is best arranged on a long narrow table which has two strong rails screwed down upon the top. On these slide a platform to carry the camera and the easel upon which the original is fixed. The idea has been carried out in a very neat way in the Southport enlarging table, which is equally adapted for artificial light enlarging or ordinary copying. In this model the easel can be raised and lowered and turned on a pivot so that the image can be quickly got into correct position on the ground glass. It is, however, open to anyone to make a somewhat similar arrangement on as simple lines as may be desired. I would rather work with a couple of slate battens and two grocers' boxes, than fumble about with no proper means of keeping things square.

The camera may be of the simplest type, but it must have fairly long extension; about three times the longest side of the plate to be used is a useful length. Rising and cross fronts are desirable, as they save moving the original, but a swing-back is unnecessary and even undesirable. A camera which has insufficient extension may be lengthened by the addition of a wooden box or cone; if carefully used, a cardboard extension will answer very well.

The lens should be a non-distorting one, and as an aperture of *f*/16 is large enough for almost all work an expensive instrument is not needed. Any fairly good rapid or wide-angle rectilinear or one of the old triplets of Dallmeyer or Ross or the doublets of the latter maker will all be found satisfactory. Of course, if a modern anastigmat is available, by all means use it, but such good lenses are rarely needed in ordinary studio copying. I have at a pinch used the single lens of a very small Kodak when my bellows extension was not long enough to give the desired magnification with any other lens, and found it quite satisfactory when stopped down.

As a guide to the necessary camera extension for any particular lens, I will venture to repeat the formula for finding the conjugate foci; everyone is supposed to know it, but few remember it when needed. Briefly it is as follows: The distance between lens and original when reducing is the focal length of the lens multiplied by the degree of reduction plus one focal length. The distance between lens and plate is the focal length divided by the degree of reduction plus one focal length of the lens. As an example, reduction to one-third scale when using a nine-inch lens requires four times nine inches or three feet from lens to original and three inches plus nine inches, or one foot from lens to plate. These measurements would be, of course, reversed if we were making a copy three times the scale of the original. By applying the same rule we find that for a copy the exact size of the original we require double the focal length of the lens in use both before and behind it. Much time may be saved by marking the positions for full size, half-scale, double-scale, and any other desired sizes upon the runners of the copying table.

It is useless to expect the best possible results if only plates of portrait rapidity are available. Excellent negatives can often be obtained from good originals, but it is much easier to work with "ordinary" plates for the majority of originals, while "process" plates should always be used for line subjects and very flat and faded silver prints. Some people imagine that orthochromatic plates, with a blue or a yellow filter, are needed for the latter class of subject, but after careful trial I vote in favor of the "process" variety. These have also the great advantage that they can be more easily intensified than ordinary or rapid plates. I am not at all unmindful of the necessity for using orthochromatic or even panchromatic plates for many classes of original, and in most cases the use of a color screen is a great advantage, if not a necessity. For one thing it minimizes the grain, especially with deep brown or yellowish originals, and it is indispensable with colored originals, especially when there are blue draperies. Much is claimed for self-screened plates, but for difficult subjects they are not to be compared with an ordinary ortho plate and a suitable filter. I need hardly say that the filters should be of the modern dyed gelatin type, the old brownish yellow-glass giving very little correction while enormously increasing the exposure.

The exposure of copy negatives calls for a considerable amount of skill, and only those who are constantly engaged on this class of work can make certain of getting the time accurate, yet this is the crux of the whole thing. Much may be learned by making a few strip tests upon various subjects, making a note of the exposure which is judged to be correct, and noting also the time taken to match the tint in an ordinary Bee Exposure meter. At any subsequent time the correct exposure can be found by taking the meter time again and increasing or decreasing the previously noted exposure accordingly. Perhaps an example will help to explain what I mean. Suppose we take an ordinary cabinet print and we find by means of our strip test that with a certain lens aperture and plate, one minute is needed to give a good negative the same size as the original. We find also that the Bee meter exposed to the same light takes ten minutes to match the tint. Then at a later date, wishing to do a similar job we again use the Bee meter and find that it takes fifteen minutes to reach the tint. This means that we must increase our exposure in like ratio and give a minute and a half. The color of the original is an important factor, and more especially the color of the paper itself. If we have two bromides, one on pure white paper and one on cream toned base, the latter will require at least twice the exposure of the former upon an ordinary plate. In like manner a sepia toned print will need much longer exposure than a black and white if we are to get satisfactory rendering of the half-tones.

The lighting of the original should in nearly all cases be strong and direct; very flat and diffused lighting gives flat negatives. We may here take a lesson from the photo-engraver who uses a couple of powerful enclosed arc lamps, one on either side of his copy-board. This not only gives even illumination but minimizes any tendency to show the granular texture of the original. For small work a couple of good upright incandescent gas burners will make a very satisfactory illuminant, or a couple of the new small half-watt lamps. The ordinary carbon and metallic-filament lamps give too yellow a light to be good for copying except with ortho plates.

If the exposure be reasonably correct copy negatives require no special care in development, and the developer used for other work will do, with the addition of a little bromide solution. If the progress of development be judged by inspection it is necessary to remember that a copy always starts fairly evenly all over, and to the inexperienced eye would appear to be over-exposed. This should be disregarded and development carried on for the full time, when a bright negative should result.

Great care should be taken of customers' originals, not only with regard to stains and finger-marks, but in the matter of fixing upon the copy board. Never stick a pin through a print or mount which does not belong to you. If drawing pins or push-pins are used the print should be held under the head of the pin and not by the point. Unmounted prints are best copied in a printing frame with a plate-glass front and strong syringe, and this is useful also for many very small originals such as prints out of lockets, small ivories and the like, which will not bear having even the slightest part covered up. On no account wet a print or tamper with it in any way without the consent of the owner. For example, an unmounted snapshot which has been carried about and become creased should be dry-mounted before copying, but permission should always be asked.—*B. J.*

Processes for the Reversal of a Negative or Positive Image

In many distinct branches of photographic work there is the occasion for the reversal in the same sensitive film of the image, either latent or developed, produced by light. For example, where a number of lantern slides require to be made from drawings or diagrams in books, and only one slide of each is wanted, there is obviously an economy of material if it is possible to produce upon the lantern plate not a negative but a positive of satisfactory quality. In the making of copies, as is now very largely done in installations, such as the photostat, there is a preference for a positive copy, although the great majority of such copies are negatives, that is to say, in white lines on a dark ground; and a positive, when it is supplied, is usually made by re-copying the negative copy. Another application of the same principle is in the making of an enlarged negative, on a dry-plate or bromide paper, direct from a small one without the intermediary production of a positive transparency. In certain photo-mechanical processes there is likewise a similar demand, as there is also in the business of while-you-wait portraiture. Some few years ago a paper specially manufactured in order to yield a single positive portrait by exposure in the camera was placed on the market, and though it yielded excellent results by a very rapid method of manipulation, did not obtain any substantial market, apparently not from any defect in the material, but from reconstruction of the American firm by which it was made. On these several accounts there is thus some considerable interest in the processes which have been suggested or worked at one time or another for producing results of this kind, and of which one class is those which obtain by direct development a positive instead of a negative image where a plate or paper is exposed to a subject in the camera, or, on the other hand, a negative instead of a positive image when the material is exposed on an enlarger easel on to which the image of a negative is projected. The second class of process, and by far the greater, is that in which an image is developed in the first instance, and is then dissolved by some solvent of metallic silver, the residual emulsion then being caused to form what may be called a complementary image, that is to say, positive if the original image was negative and *vice versa*.

The second type of process is one which within the last few years has become familiar from the fact of its use in the Autochrome process, where the original negative image is dissolved by means of the solution of permanganate and acid, and the remaining emulsion, after exposure to light, developed to form a positive. But processes of this kind are of very much older date than the Autochrome process, and include within themselves a considerable number of variations of the same principle. For example, a method, brief instructions for which we have given for many years past in the Almanac, consists in removing the first developed image with a 2 per cent. solution of ammonium persulphate, afterward re-developing the remaining emulsion with a developer containing a fair amount of bromide. This is a process which we have frequently used in the past for making a duplicate negative directly, although, of course, when the plate is printed by contact the reproduced negative is reversed as regards right and left, and if printed in the ordinary way yields reversed prints.

In all processes of this kind the differences consist chiefly in the means adopted for removing the first developed image. One of the earliest processes is that of M. Coustet, published in 1905, in which the image is removed by hydrogen peroxide prepared by making up a solution as follows:

Water	1000 c.c.
Hydrochloric acid . . .	100 c.c.
Barium peroxide . . .	50 gm.

This solution, on a negative being immersed in it, dissolves not only the silver image but the gelatin holding it, yielding a plate which bears an image composed of various thicknesses of gelatin and unaltered silver haloid. M. Coustet dissolved out the haloid with hypo, and obtained his reversed image by dyeing the gelatin.

In most of the processes, however, the original image is removed with either bichromate or permanganate dissolved in water, with the addition of acid. A formula recommended by Maes (*B. J.*, March 20, 1908, p. 215) for the making of enlarged paper negatives directly consists in developing with amidol, washing out the developer, and exposing for a few seconds to daylight or to an incandescent burner for from thirty seconds to a minute at about a foot distance. The print is then placed in a solution:

Potass. bichromate . . .	15 gm.
Nitric acid	6 c.c.
Water	500 c.c.

The solution dissolves the silver image and converts the silver bromide into silver chromate. After washing for a considerable time or immersion for a few minutes in a solution of soda sulphite and soda bisulphite, the negative print is developed with amidol to sufficient intensity. Using a similar process, C. R. M. Parr (*B. J.*, November 8, 1908, p. 846) employed the following solution for removal of the silver image:

Potass. bichromate . . .	75 gr.
Nitric acid	30 mm.
Water	5 oz.

The print is subsequently passed through a solution of soda sulphite and potassium metabisulphite, re-developed with amidol, fixed and washed.

This process—of dissolving the acid bichromate and re-developing—was worked out very thoroughly by Douglas Carnegie, who, we know, used it regularly for the making of the large number of lantern slides from book illustrations which he constantly required in his work as a University Extension lecturer. The details which he published of the process are contained in two articles in the *British Journal* of October 23, 1908, p. 811, and July 9, 1909, p. 528. The lantern plates were exposed in the camera glass side toward the lens, and developed film up in an M.Q. developer, using sodium carbonate as the accelerator until the image was clearly visible on the film surface. Development occupied about five minutes. The plate was well rinsed for about one minute and flooded with a reversing solution of:

Ammonium bichromate . .	150 gr.
Nitric acid, concentrated .	1½ dr.
Water	20 oz.

The two or three minutes' immersion sufficed to remove the silver image, after which the plate was rinsed for about one minute, and placed in a black developing dish, to the bottom of which a couple of narrow strips of glass had been cemented, so that it could be laid therein film downward. The previously used developer was poured on, or rather the plate introduced slantwise into the developer in order to avoid air-bubbles on the surface of the film, the dish rocked for about half a minute, and then about three-quarters of an inch of magnesium ribbon burnt at a vertical height above it of about three feet. The plate was then left to develop for a further five minutes, fixed in an acid fixing-bath and washed. In the case of slides from full-tone negatives a weaker light, such as that from a flat-flame gas-burner, was found necessary in order to preserve the tones of the negative. If any fog be left on the slide treatment with Farmer's reducer would remove it without reducing the contrast or vigor of the heavier deposits.

The Carnegie process was tested for its practical usefulness by Dr. D'Arcy Power, whose list of the precautions necessary in working it are as follows (*B. J.*, March 17, 1911, p. 194): 1. Expose glass side outward, so that full development may be obtained without fogging. 2. Develop for greater density than usual in a negative. 3. Wash for from three to five minutes. 4. Turn film side down in a pan of water with a piece of black paper next the film, and remove into full daylight from three to five minutes. 5. Return to dark-room, remove plate, face up, to a bath of ½ per cent. ammonium bichromate acidulated with 1 per cent. nitric acid. In three minutes the image will disappear. 6. Wash in dark-room for fifteen minutes. 7. Redevelop to rather more than required density. 8. Fix in hypo. 9. Should, as is often the case, the surface be soiled by a slight deposit, one much like that on the surface of lots of developing papers, wash over with a little weak Farmer's reducer, and it readily disappears. 10. Wash. The resulting slide should be identical in gradation with the subject. It can be reduced, intensified, or toned like any other lantern-slide.

As regards the exposure to light for re-development, a recommendation of Balagny (*B. J.*, August 12, 1910, p. 609) is to make this exposure before dissolving out the primary image, on the ground of the silver image protecting the underlying layer of silver bromide and so preventing fog. For protecting the back of the plate during this exposure Balagny squeegees on a non-actinic tissue, then exposing for from one to five minutes in diffused daylight.

Processes in which acid permanganate has been used as the solvent of the first image have been frequently described since the successful employment of this means in the Autochrome process. The very thin film, however, of the Autochrome plate renders reversal a much easier operation than it is with ordinary dry-plates, or even with the more thinly-coated bromide paper. A permanganate formula recommended for Ilford "Smooth Slow" bromide paper by the Rev. F. C. Lambert (*Photographic Scraps*, October, 1908, p. 270) is:

Potash alum saturated solution	2 oz.
Sulphuric acid 20 per cent. solution	1 dr.
Potass. permanganate solution.	Enough to give the mixture a port wine color.

The print is developed until the highest light can be fairly seen on the back of the paper, is rinsed, and after treatment in the permanganate bath is passed through a weak solution of oxalic acid to remove any stain. It is then washed for five minutes, laid flat on the bottom of the dish, and exposed to the light of a gas-burner for, say, thirty seconds at one foot. If on re-development no image is produced at the end of a minute further exposure is given as required to assist development.

A permanganate formula of G. H. Truman (*The Camera*, May, 1910, p. 194) is compounded from a stock bath consisting of 10e grains potass. permanganate in 10 ounces of water. One ounce of this solution is mixed with 10 ounces of water and 1 dram strong sulphuric acid added.

It will be observed that in all these methods a certain nicety is required in exposing the print to light before or after reversal in order to obtain proper re-development of the residual image. A process which dispenses with this uncertainty consists in replacing the re-developer by a solution of sodium sulphide. A method on this basis was worked out by the Eastman Research Laboratory (*B. J.*, February 9, 1917, p. 68), apparently in ignorance of the fact that an almost identical process was suggested by W. Morison in *The Bromide Monthly*, October, 1908, p. 191. According to Morison, the paper print is developed fully, rinsed in water, and then placed in a bath of chrome alum, after which it is treated in a sulphide solution as used for sepia toning. The sulphide converts the unaltered silver bromide emulsion into silver sulphide, but does not affect the developed silver image. After washing, the developed image is then dissolved out most conveniently by bleaching with a solution of ferricyanide and bromide followed by a hypo bath. The working details of the process published by the Eastman Laboratory differ from those of Morison first as regards the sulphide solution. The latter should be of fair strength, namely, 1 ounce 330 grains of sodium sulphide cryst. dissolved in 32 ounces of water, and preferably with boiling of the solution in order to throw down any iron. The bath should be used at a temperature of 70° F. The solution for the removal of the primary silver image is:

Potass. ferricyanide	11 oz.
Ammonium sulphocyanide	11 oz.
Water to	32 oz.

This very strong bath is applied for from three to four minutes at a temperature from 65° to 75° F., and owing to the solvent action of the sulphocyanide on silver bromide fixes the print as well as removes the silver image.

A process which is something akin to the last one is that of W. L. M. Bennett (*Amateur Photographer*, August 24, 1909, p. 181). Here, as in the last-mentioned process, the primary silver image is removed, not by an acid oxidizing solution, but by converting it into a compound, which is afterward easily soluble. Bennett tones the primary silver image in a strong uranium toning bath for five or ten minutes, the object being to convert the silver deposit completely into uranium ferrocyanide. After washing and treatment for one minute in a bath of ammonium sulphocyanide (2 grains per ounce), it is well washed, laid face up in an empty dish, and exposed to the light of an inch or two of magnesium ribbon burnt about two feet distant. It is then re-developed, the alkali of the developer removing the uranium-converted primary image. Obviously the uranium image might be removed with a bath of carbonate of soda, and the residual silver bromide darkened with soda sulphide, thus dispensing with the necessity of exposure to light.

The problem of forming the reversed image from the residual silver bromide is one which has been dealt with in still another way by MM. Lumière and Seyewetz, who record the success attending the dissolving out of the silver bromide that is left and the re-development of the image which remains with a mercury physical developer or rather intensifier. Their process consisted in developing the original image thoroughly for about four times the usual time, and then in full daylight dissolving the image in a permanganate bath of the composition:

Potass permanganate	1 gm.
Sulphuric acid, strong	10 c.c.
Water	1000 c.c.

The negative is rinsed, cleared with a 2 per cent. solution of soda bisulphite lye, and if not perfectly bleached again passed through the permanganate and bisulphide baths. It is then fixed in a 10 per cent. solution of hypo, thoroughly washed, and the image, which through the exposure to light has been rendered susceptible to re-development, brought up in a solution prepared from the two following stock baths:

A

Soda sulphite, anhydrous	180 gm.
Mercuric bromide	9 gm.
Water	1000 c.c.

B

Soda sulphite, anhydrous	20 gm.
Metol	20 gm.
Water	1000 c.c.

Fifteen parts of A are mixed with 4 parts of B, the reversed image developing slowly in the mixture with freedom from fog.

A variation of this method in which the silver image is not dissolved until it has been used as a kind of screen in exposing the residual silver bromide was also described by Lumière and Seyewetz. In the case of this process the plate is fully developed, rinsed for about a minute, and then placed against a dark ground, such as a sheet of black paper, which is pressed on the glass so that light reaches the emulsion only from the film side. The plate at this stage is then exposed to the light of, say, an incandescent burner for about ten or fifteen minutes at a distance of 20 inches, the silver image then dissolved in the permanganate bath given above, this treatment, as also the subsequent operations, being done by the ordinary dark-room light. The plate is passed through a weak bath of sodium bisulphite, rinsed, fixed in 10 per cent. hypo, thoroughly washed, and the image brought up with the mercury intensifier, made according to the above formula. The intensification is a slow process, occupying from one hour to an hour and a half, but yields an image of very fine detail and of density equal to that of a negative developed by the customary alkaline method.

In all these processes in which an acid solution of permanganate is employed for the solution of the silver image it is an important point that the solvent bath should be free from chlorides, otherwise the image is partly converted into chlorine, and on re-development or other subsequent process will be reproduced as deposit, which fogs what should be the high-lights of the new image and produces an effect worse than a general fog. Commercial permanganate often contains chloride impurity, which can be removed by addition of a few drops of silver nitrate solution to the bath. —*B. J.*

Why Deposits Come in Photographic Solutions

While every photographer who makes up his own solutions must necessarily know that in some cases the chemicals dissolve to a water-white mixture while in others the preparation is turbid or muddy, many no doubt who have not thought it worth while to devote a little study to the properties of chemical substances are somewhat in the dark as to when or why chemicals behave differently in this respect, and when or why any harmful result in the use of the photographic solutions may follow. The subject, therefore, may deserve a few notes by way of information and explanation to those who would sooner use their own intelligence than blindly follow directions.

So far as concerns the great majority of the chemicals which are used in making up developing, fixing and other solutions in common photographic use according to the customary formulæ, it may be said that such solutions, if made with perfectly pure water, will show scarcely a trace of turbidity or milkiness, much less any considerable quantity of deposit. But for most purposes it is not customary or necessary to use water of the purity secured by distilling; ordinary tap water, while it is inferior to distilled water, particularly for certain chemicals, is good enough on the whole for mixing developers, fixing-baths, etc., for ordinary use. However, the small quantities of impurities which it does contain are one cause of the chemicals of these baths not dissolving to perfectly clear and bright solutions. From this point of view the impurities in tap water are of two chief kinds: (1) mineral salts of lime and magnesia existing dissolved in the water in the form of carbonates or sulphate and partially deposited from the water by boiling, and (2) ordinary common salt consisting of sodium chloride. In the first class of these impurities are those which make the water "hard," a property of ordinary town water which varies very greatly in different localities.

Of the lime and magnesia salts, those existing in the water in the form of sulphates remain dissolved even though the water be boiled, while those existing as carbonates, by virtue of carbonic acid gas contained in the water, are deposited by boiling, forming the scale or "fur" familiar in kettles and of soft powdery nature if the water contains only carbonates, but hard and almost stone-like if the water contains also sulphate of lime. Thus it will be understood that in the case of a water containing, as most do, dissolved lime carbonates, the mere operation of boiling or heating to a temperature somewhat short of boiling throws down a certain proportion of these carbonates owing to the expulsion of the carbonic acid gas. This is one cause of want of clearness in the solution, but the fact is also a reminder that ordinary tap water can be considerably improved for solution-making purposes by first bringing it to the boil, allowing it to boil briskly for a minute or two, then standing it aside to cool gradually. By this means the carbonates of lime are almost completely deposited: they settle after a little while and the clear water can be poured off from them. Actually there is little gain from this process so far as the removal of the lime carbonates is concerned: the chief advantage of the process is that the dissolved air is boiled out of the water, so that the solution of a developing agent such as pyro, which readily oxidizes, is given a better chance at the start of forming a colorless solution and of retaining its properties unimpaired.

In making up solutions, however, lime salts dissolved in the water in any form may cause a considerable amount of deposit. This is so, for example, in making up solutions of oxalate of potash (for the platinotype developer), since the oxalate forms an insoluble oxalate of lime which produces a very milky mixture. In this case the deposit can be given a day or so to settle and the solution poured off from it, although no great harm will result if it is used in the milky state produced when it is freshly mixed. Ammonia and any salt of mercury or lead are also compounds which form a greater or less degree of milkiness when dissolved in ordinary hard water.

Chlorides (salt) in a water are usually present in very small measure, but that is quite enough inevitably to produce a milkiness in any solution into which silver nitrate enters as a constituent. The silver nitrate forms insoluble silver chloride with the salt. This is a case in which it is just as well to use distilled water in order to obtain a bright solution, for example in making up the intensifier for the Autochrome plate according to the original instructions. On the other hand, the stock solutions for some other silver intensifiers, such as the Wellington, which are used in conjunction with hypo, may just as well be made up with ordinary tap water, for any opalescence due to chlorides will be cleared up on addition of the hypo.

The above considerations are the chief of those which relate to the effect of tap water in making up the photographer's customary baths, but they do not take account of impurities in the chemicals themselves. Occasionally but not by any means invariably, impurity of a chemical is indicated by its forming a milky or turbid solution. This is the case, for example, with sodium carbonate, a good, pure crystallized sample of which will dissolve even in ordinary water to almost a bright solution, whereas the cruder washing soda will almost always give a turbid solution owing to the precipitation of alumina and other impurities contained in it. Hypo may be another case in point, for a bad sample will often reveal its inferior quality by forming a slightly milky solution, although we think it is not perfectly safe to condemn a sample of hypo on this ground nor to assume that the substance is of A1 quality because it dissolves to a bright solution.

We may conclude these notes by reminding the photographic experimenter who has not had any chemical training that all kinds of deposits and precipitates are to be expected in dissolving various chemicals in the same solution. Broadly, it may be said that addition of any soluble carbonate (sodium, potassium, or ammonium carbonate) will bring down a precipitate if dissolved in the same solution as a salt of almost any other metal, but particularly the heavier metals—lead, mercury, iron, copper, bismuth, aluminum and chromium. Caustic alkalies also such as ammonia, caustic potash and caustic soda behave very similarly in this respect to the carbonated alkalies, while there are very few metallic salts which are not precipitated by a solution of sodium sulphide. In all these cases a double decomposition takes place: the heavier metal is thrown down as a carbonate, hydroxide or sulphide, and the acid radical with which it was combined unites with the alkali of the carbonate, hydroxide or sulphide. Other soluble compounds are less general in their precipitating action. For example, the solution of a sulphate produces a deposit as a rule only with compounds of lead and barium. There was an instance of the latter mentioned not long ago by a correspondent, who avoids certain drawbacks of barium sulphide in sepia toning by adding sodium sulphate to the solution, with the result that barium sulphate is thrown down and sodium sulphide left in solution—when all is said and done, simply a roundabout way of making a weak solution of sodium sulphide. Ferrocyanides are another class of salt which form precipitates with many salts of the heavy metals, but the deposits may be kept in solution by adding certain other compounds which apparently remain unaltered but serve to prevent the formation of a precipitate. Citrate of potash is the best example of a substance of this kind, and is used for this purpose in the copper toner of Mr. W. B. Ferguson. It is a substance which may be commended to the photographic experimenter as perhaps the best preventive there is of many precipitates, and also one which in many cases will exert no other action than this solvent one.—*B. J.*

The Fixation of Gaslight Prints

An amateur photographer once asked a professional how it was that orders took ten days to complete when he (the amateur) could take a photograph and finish it the same day. The professional replied that the making of a thousand finished photographs was not quite the same thing as the making of a single quarter-plate print.

He was right in more ways than one, for photography in quantity involves many things over and above multiplication, and in no case is this truer than in the case of gaslight prints. The exposure that makes one perfect print may not make a dozen if switched on twelve times, because currents often fluctuate and emulsions get mixed, and gaslights have not sufficient latitude to cover these changes. The developer that gives the desired result on an experimental print may fail to turn out a quantity as good. But it is fixation I want to talk about now.

Almost any fixing-bath will fix a single gaslight print or a small number of prints, but the fixation of large batches that must be washed automatically and dried automatically and finished to time is something of a problem. In the first place, if the system does not include a stop bath the fixer must be acid, to prevent the risk of staining and continued development, when the bath is not quite new. Then to permit of rapid or hot drying (which is very essential when dealing with thousands per day) a hardening agent is required. This, of course, might be applied as a separate bath, but to simplify matters and save time it is usual to incorporate it with the fixer, and thus we get the numerous well known acid-hardening fixing-baths. Now while the acid may assist the fixing proper, by killing the developer, the hardener hinders it by closing up the pores of the gelatin and making it comparatively difficult for the hypo to do its work. It is also natural to suppose that the washing water is hampered in the same way, and so we come to believe that plain hypo is advisable if permanence is desired. But the trade production of gaslight prints demands both acid and hardener together, and the only alternative would be to employ them as separate baths, washing after fixing and before hardening, and then washing again. And this would means extra time and extra labor. I have tried all the acid fixing-baths, but without finding one that was absolutely satisfactory until I evolved one from two old formulæ, and up to now, after extensive use, I am of the opinion that my mixture is a good one. I give it below for anyone who cares to try it. It is a little troublesome to make up, but can be used for plates, films, and bromide papers, besides gaslights, and it has been found very good for the former in hot weather. The formula is:

A

Hypo	1 lb. av.
Water	60 oz. av.

B

Water (hot)	15 oz. av.
White alum	½ oz. av.
Chrome alum	¼ oz. av.
Sodium sulphite . . .	1 oz. av.
Glacial acetic acid . . .	½ oz. av.

In compounding B, first completely dissolve the white alum in the water, and then add the chrome alum. When this is dissolved add the sulphite, and when the mixture has cooled down put in the acid, then wait for all cloudiness to disappear before adding B to A. I should add that the formula was originally devised for prints that had been through a stop bath; for use with prints coming straight from the developer it is advisable to use an extra ½ ounce of the acetic acid.

The fixation of large batches, to be thorough, must be attended with great care. In some workshops it is the practice for prints to be fixed by the worker who develops, and if the prints are in small quantities there is no reason why anything should go wrong. I do not believe it possible, however, for a very busy developing operative to divide his or her attention between two dishes without something suffering. An alternative is to have a special assistant for fixing, and if the work is fixed immediately after development this means one fixer to each developer, or at the least one to every two. A compromise can be brought about by the use of acid stop baths, into which the prints can be dropped to await periodical collection for mass fixation. This method has the advantage of giving special attention to fixing without undue increases in staff, one hand being able to deal satisfactorily with anything up to 6000 per day. It will be understood, of course, that this means a skilled hand who knows what fixing is, and not a new apprentice.

The composition and strength of a stop bath for quantities of gaslight prints is a matter of some importance. The first time I tried the method I used a 1 in 80 solution of glacial acetic acid, and found it all right at the time. This was with amidol, slightly restrained with bromide, as the developer. Being left unexpectedly without amidol through a consignment failing to arrive, I tried M. Q. for a time, and found the stop bath still worked. Preferring amidol, I tried another make, and then things began to happen. Prints stained by the dozen, the stains being of that yellowy pink so common to gaslight papers when forced or developed without restrainer I tried longer exposures, but found that the stop bath then failed to stop, the print continuing to darken until removed to fix. An increase of bromide reduced the trouble, but spoilt the color of the work. A reduction in the amount of bromide, coupled with an addition of metabisulphite, had a beneficial effect, but was not an absolute cure. A peculiarity of these stains was the fact that some did not appear until the print was fixed or even washed. Suspecting that the acid was not capable of neutralizing the developer, I soaked unused paper in developer, then in the acid, and dried it without washing. It was stained. I then tried a piece of clean writing paper the same way, with the same result, so I decided against the acetic, and began to use sulphuric. Similar tests with sulphuric showed much cleaner results, and as a stop bath it had the advantage of cheapness, besides efficiency, a strength of 1 in 60 being active. But after using a little while the sulphuric bath throws off sulphur dioxide from the sulphite on the prints, and though this is an excellent germicide it is not every photographic hand that can put up with it. In the case I am referring to, the acid had another objection. Occasionally prints would appear in a semi-toned state; they seemed to acquire the colored patches in the wash, but the only feasible solution of the occurrence was that traces of sulphuric acid had been carried in the film to the fixing-bath, where the action of hypo on it had deposited sulphur in the gelatin, and this caused the toning before it was washed out. To have used sulphurous instead of sulphuric acid would have obviated this possibility, but would have been as bad with regard to fumes. Metabisulphite might have solved the problem, but I could not obtain a supply of standard quality. I eventually resorted again to acetic acid, and tried using it stronger, and this, in combination with an acid amidol developer, worked fairly well, though I am convinced that acetic acid as a stop bath is not ideal, and I hope to find a substitute that will be efficient without being obnoxious or expensive.

With bromide and slow development papers the same demands are not made on the stop bath, and as far as my experience and information go, a weak solution of acetic acid is quite suitable.

There is one hint I think may be useful to devotees of the stop bath system. Some workers have doubts as to when the bath is exhausted. It can be tested easily by means of litmus papers, and these can be bought in little books from any wholesale chemist. Blue papers should be specified. To test the bath, tear off one of the leaves, and soak one end of it for a second in the developer, then transfer it to the bath for five or six seconds. Inspect it by daylight, when, if the bath is fully active, the wet part of the leaf will be brilliant red. If the color is doubtful or is a mixture of red and blue patches the bath is getting exhausted, and should be thrown away. A leaf dipped direct into the acid bath will redden after the bath has lost strength, and so is not a fair test.—THERMIT, in *B. J.*

Reproductions on Bromide Paper

AT some time or other the photographer may be called upon to reproduce, say, a letter, drawing or map, and we give here a useful and economical method which dispenses with the use of a plate. It is suitable for facsimile reproductions from documents that are written or printed on one side only.

If the usual exposing box is not large enough to take the document, a large printing-frame with a stout glass bed should be used. The document is placed on the glass of the open printing-frame face up, a piece of glossy bromide or gaslight paper placed in contact with the writing, and the back of the frame firmly fixed in position. An exposure should now be made to a light at such a distance as will give even illumination, but no data can be given as to correct exposure. It is a matter for trial and error, using a small strip of paper as a test.

Gaslight paper gives greater contrast than bromide paper, and the idea is to get a paper negative showing clear white letters or lines on a black ground. This negative is developed, fixed, washed and dried, placed in the printing-frame face up, another piece of bromide or gaslight paper is placed in contact with the film side and exposed. The resulting print should be an exact reproduction of the original document, but usually there is some degradation of the white parts, and in order to get these clear, recourse must be had to the iodine-cyanide reducer.

It is a practice among some workers to purposely overexpose the prints so as to obtain good black lines, thus introducing considerable grayness of the white parts. The reducer is used on the prints after they have been fixed and well washed, and if carefully applied it will eat out the gray parts without appreciably affecting the black lines. After reduction, the prints must be washed in running water for about ten minutes.

Stock Iodine Solution

Potassium iodide	¼ oz.
Iodine flakes	20 gr.
Water to	10 oz.

Stock Cyanide Solution

Potassium cyanide	40 gr.
Water to	10 oz.

To make a working bath for slight clearing take 1 ounce of each stock solution and make up to 20 ounces with water. The reducer may be used stronger than this, but it is very risky, and may attack the black lines strongly.—(From "Rajar Trade Notes.")

A Method of Correcting Harsh and Halated Negatives

A HARSH negative is an underexposed and overdeveloped one of a contrastily lit subject. Such a negative can be made without the underexposure, but as this would merely mean culpably bad development I will pass over fully exposed negatives for the moment.

To obtain decent prints from a negative with clogged high-lights and empty shadows is difficult; to get perfect ones, impossible, particularly if halation is added to the harshness.

In studio work harsh negatives can be avoided by using a full and well-diffused light, but in home portraiture and commercial work ideal light cannot always be had (the prevailing light as often as not falling in a wrong direction) to illuminate one or two patches of the subject intensely while other parts are in darkness. The different intensities of light reflected from two parts of a subject may be beyond the power of any emulsion to register correctly in one exposure, and the operator must perforce do one of two things, if not both. He must overexpose the high-lights or underexpose the shadows. With movable subjects the former course is not always practicable, and the resulting underexposure is often the root cause of a harsh negative, by inducing overdevelopment in the vain hope of getting shadow detail. Harsh negatives can be avoided in any circumstances by tank development with a suitable formula if sufficient attention is given to details like time and temperature, but the right system for negatives of contrastily lit subjects might not be the best for any other kind.

But like all preventable things, harsh negatives will always occur, and a cure is often useful. The following method is based on the fact that high-light density is of a greater depth in the gelatin of a negative than shadow detail is, and halation is allowed for on account of it being deeper still. It will be obvious that the removal of all silver in the lower stratum leaves the high-lights appreciably thinner and without halation, while not affecting the shadow detail. This can be done by bleaching, followed by partial redevelopment and fixing, and any of the solutions in common use will serve. I have found advantages, however, in using (1) a bleacher containing bichromate and (2) an amidol developer, the formulæ being as follows:

Bleacher

Potass. ferricyanide . .	1 dram
Potass. bromide	1 “
Potass. bichromate . . .	1 “
Water	5 ounces

Developer

Sodium sulphite . . .	½ ounce
Amidol	20 grains
Water	20 ounces

Fixer

Hypo	4 ounces
Water	20 “

Before treatment a negative must be thoroughly fixed and free from hypo. Bleaching can be carried out in daylight and proceeded with until the whole of the deposit has changed color, when viewed from the reverse side of the negative. A short rinse is then given and the negative is placed in a clean dish, the developer being poured smartly on to the center. Dropping the negative into a dishful of developer will result in uneven action. Development is carried out in daylight and the negative inspected from time to time on the reverse side, and when all but the overdensities has blackened the negative is rinsed again and transferred to the fixing. If all the operations are carried out carefully and correctly the following actions will take place. The silver image will be converted to one, both redevelopable and soluble in hypo. The top layers of the image, *i. e.*, the shadow detail and moderate densities of the high-lights and gradations between these, will be redeveloped, and at the same time brightened up to some extent by the action of the bichromate. The surplus density of the high-lights and also any halation, being either not redeveloped or only redeveloped to a slight extent, will remain largely soluble in hypo and disappear in the fixing-bath, leaving a negative which is anything but harsh.

Some possible mishaps with the process are: Insufficient bleaching, which leaves the unwanted deposits untouched and irremovable; over-bleaching, which may result in stain or obscure complications; insufficient redevelopment, which leaves the image proper susceptible to hypo, and may mean the loss of the negative; over-development, which leaves the negative as bad as it was originally. In the last case the process can be repeated after washing.

In careful hands the above method of improving harsh negatives can work wonders, and it has the advantages of local treatment without risk of the patchy results so common to various forms of local treatment—THERMIT, in *B. J.*

Coloring Lantern Slides

THE specific directions as given with sets of dyes for lantern slide coloring are useful to a beginner who is told to use tints weakly and to be near a tap. But once experience is gained the tendency is to speed the work by using less moisture, it being certainly tedious to keep building up by repeated washings when one application of the brush should do it. It is suggested to those who have some experience to try the following method:

First make up a one-ounce bottle of medium of equal parts of glycerine, alcohol and water. Next, on a piece of opal or back of plate, place a few grains of a dye in powder, make it into a paste with a few drops of medium and grind the dye fine with a palette knife. Some dyes dissolve easily; others, of the crystal class, are troublesome. About four or five colors are each treated similarly until a palette is formed with dissolved dyes with the least amount of moisture. A large and small brush and a jar of water for rinsing brushes only are placed at hand. A well-fixed and thoroughly washed slide having been allowed to dry before coloring (otherwise the film will be tender and soon damaged) is again wetted and drained. If in a hurry to start, press off excess of water with the palm side of the hand lengthwise of the slide. The slide, say, is a design for a cinema theatre, announcing the orchestra, wording in a circle, with outer scroll work. Hold the slide over white paper and with a small brush take up strong blue and paint the background to the letters. Then with yellow-brown used strongly paint the outer scroll work. By this time the dark blue will have dried somewhat. Then paint the letters a weak tint of yellow-brown made with the medium. If coloring a sunset at sea, invert the slide, putting the right and strongest tint of orange first, and by dipping the brush in the medium gradually weaken the color toward the part that will be tinted with blue. This roughly illustrates that the darkest touches can be put in first and the weakest last, and that plain water is not used as a vehicle. If very wet watery solutions are used there is great difficulty in preventing tints running one into the other. When the slide is finally stained it can be rinsed to get rid of the glycerin and put away to dry free from dust.—*B. J.*

Mounting Big Enlargements

It is not every photographer that realizes the value of cut-out mounts when making enlargements of an unusual size. The big size that comes along at odd times, and is just too large for the dry-mounter and too awkward for wet mounting on a good board or a plate-sunk mount, may be got rid of comfortably with the aid of a cut-out.

First of all the enlargement should be rough mounted on a thin board the same size as the paper. Unless the latter is very large, this can be done in the dry-mounter, but even if it has to be done wet there will be no difficulty, as the edges need no trimming and paste marks on the edges of the board can be ignored. In this state the picture can be spotted and worked up.

Cut-outs of any size can be obtained from picture framers, but there is no great difficulty in making one's own, and for this a sharp knife and a straight steel rule are necessary. The orthodox mount-cutter's knife and straight-edge are the best tools, but by no means essential, an expert being able to do as well with a pocket knife and a bed lath. The knife needs a tapering and razor-edge blade, and the rule must be dead true and preferably very thin at the edge. Before cutting, the center must be marked out in pencil, taking care to get the corners square and the size definitely smaller than the enlargement, as the edges of the latter must be covered. It is a good plan at first to draw the opening too small, as then any ragged cuts can be recut. With the opening drawn out, the mount is laid on top of a sheet of card on a flat bench. The card should be a thick one to save the knife edge from blunting on the bench. The rule is laid along one side of the opening to be, so that it points away from the operator, and is about level with his left shoulder. A nail or screw in the bench will facilitate first attempts if the far end of the rule is placed with its back edge against it. The mount is then moved about until the blacklead line is perfectly parallel with the rule, but about one-eighth inch from it. Holding the rule with the left hand, the point of the knife is placed on the line at the far end, or, better still, very slightly beyond the point of the corner, and the hand is leaned over to the left until the blade touches the rule. A long, straight cut is taken down the line until the bottom corner is just overreached. In the case of a very long cut a stop may be made while the left hand is shifted if necessary, but the angle must not be altered, and with very thick mounts it may be necessary to go over the cut two or three times before moving the rule. When cut through, the next side is cut in the same way, first turning the mount to bring the line into the same position occupied by the first cut, and moving the under card a trifle so that any cuts in that will not trip the knife.

When the four sides have been cut, if the piece does not drop out it can be gently freed with the point of the knife, and the four edges are then trimmed up, if necessary, with a small piece of fine sandpaper. Careful and decisive cutting, however, will leave no need for trimming up.

To fix the enlargement, a thin line of glue, "Seccotine" or "Mendine," is run round the extreme edge, and the cut-out laid in position. A packet of mounting boards can be used as a weight to hold the mount flat while the glue sets.

Cut-outs are sometimes useful for small enlargements, and in this case can be made to do away with both dry and wet mounting. Without any trimming, the print is first slightly damped by being laid between damp blotting-paper. The edges are then glued and the mount laid on, the whole being laid on a sheet of dry blotting, face up, until the glue sets. The picture should then be perfectly flat and ready for framing, but care must be taken not to press on the print itself at any stage or it may puncture. —*B. J.*

Dry-Plate Don'ts

Don't immerse the plates in water before development. This is a common source of air-bells.

Don't forget to stir the developer in the tank before immersing the plate; this will prevent pin holes.

Don't expect water to develop a plate, especially when using a tank—it takes a definite quantity of chemicals to produce a good negative, therefore, don't dilute the tank developer too much.

Don't forget to use an ample, but not too large, quantity of developer.

Don't practice false economy by trying to use pyro developer for a second batch of plates.

Don't allow the printing paper to get damp or it will result in stained negatives and prints of uneven color which will not tone properly.

Don't permit dishes, graduates, bottles or the work bench to become unclean.

Don't permit dust to settle on the plate; to remove it, grasp it by two edges and tap the edge gently on the table.

Don't become too economical with the fixing-bath; it is cheap and plenty of it used fresh will yield clearer and cleaner results.

Don't dry the negatives where there is any chance of dust settling on them.

Don't lay the blame on the plates for unsatisfactory results until you have made certain that your manipulation is not at fault.

Don't forget to keep the developing tray in motion; this will prevent uneven development and produce a vigorous negative.

Don't use a dusting brush; it collects dust, which in turn is transferred to the plate.

Don't overlook rinsing plates thoroughly after development because if you don't there is every likelihood you will find the negative stained and the fixing-bath discolored and rendered less effective.

Don't forget to wipe your plate-holders, slides and camera frequently with a damp cloth.

Don't dry negatives in a room that is overheated; this causes melting of the film and increases the density.

Don't withdraw the negatives too quickly from the fixing-bath or portions of the emulsion will be insufficiently fixed.

Don't allow the solutions to splash on the floor, because when dry the chemicals float about the air in minute particles and injure any plate they may fall on.—*Northern Photo News.*

Photographic Prints on Drawing Paper

The excellent printing papers all ready for use which are now on the market have made processes for the home sensitizing of paper almost obsolete. Still there must be a good many amateurs who would like to try their hands at such a method, were they in possession of reliable working instructions.

The writer has made a great many prints on the lines laid down below, so that he can guarantee the complete practicability of the process. More than that, it will be found to give prints of a peculiar charm, quite distinct in character from those obtained on commercial papers. They are more like pencil drawings, being of a good black color, and quite without any suggestion of a coating on the paper. The picture just seems to rest on the natural surface of the drawing paper that is used.

The paper which has given the best results is hot-pressed "Whatman," which is supplied by any artists' colorman. The paper loses much of its smoothness in the process.

The first stage is the "salting" of the paper, which may be done throughout in any light and at any time, as salted paper keeps quite indefinitely. A couple of teaspoonfuls of arrowroot should be stirred up with a little cold water to make a very thick paste free from lumps, and then boiling water (it must be actually boiling) should be added with constant stirring until the mass thickens, when the addition of water should be stopped at once. The mixture, as soon as it is cold enough to handle, may be strained through a cambric handkerchief, with a little squeezing. A solution of a quarter of an ounce of common salt in 10 ounces of water is then made up and equal parts of this and of the arrowroot mixture are taken for coating the paper.

A piece of flannel should be washed quite clean in plain water, and then folded into a strip about three inches wide, consisting of four folds of the flannel. A clean piece of quarter-plate glass has this strip folded around the end of it and secured with an elastic band. This forms the brush for coating. The paper may be in pieces eight by ten inches or larger, and the back of each should be scribbled over with a pencil, as when wet it is hard to tell the back from the front.

A sheet of paper is put face upward on a flat surface, a little pool of the arrowroot and salt mixture (which must be quite cold) is poured into the center and quickly spread evenly all over with the "brush." This should be moved in two directions at right angles to each other, the surplus solution being swept off at two of the edges. Not more than twenty seconds should be taken to do this, and the paper may then be pinned up to dry in a warm room. The quicker it dries the better.

After the lapse of twenty-four hours, or any longer time, a second coating should be given in exactly the same way as the first.

A little while before it is to be printed, say the day before, if it is to be at its best, the paper must be sensitized. For this purpose a plain solution of 1 ounce of silver nitrate in 6 ounces of water is used. A *fresh piece* of clean flannel must be made into a brush as before, and a little of the silver solution being poured into the angle of a dish, which may be tilted up for the purpose, the brush is dipped into it, and with quick light strokes the face of the paper is evenly wetted. This operation should be carried out by artificial light only. Each sheet of paper may be held near the fire, but not so as to make it hot, so as to dry in three or four minutes, and when quite dry and cold should have a second coating similar to the first. It is then ready for use.

This sensitive paper must be kept in the dark, and should be used within a day or two. It is printed by daylight just like P. O. P., and the image is of a rather crude red color. Printing should be carried on until it seems decidedly overprinted.

The prints on this paper may be toned either with gold or with platinum. In either case, the prints must be thoroughly washed before toning, say for a quarter of an hour in seven or eight changes of water. A good bath for gold toning consists of 20 grains of sodium acetate dissolved in half a pint of water, and 1 grain of gold chloride added. This should be made up the day before it is required. A platinum toning bath can be made by dissolving 20 grains each of citric acid and of common salt in 10 ounces of water and adding 1 grain of potassium chloroplatinite. This is ready as soon as mixed.

The tone of the prints should be judged by holding them up to the light and looking through them, and not by the surface. Toning goes back a good deal in the hypo. After toning the prints should be placed in a 1-per-cent. solution of common salt, if they have been toned with gold, or of sodium carbonate if toned with platinum. After a minute or two in this they can be rinsed and fixed in plain hypo of a strength of 2 ounces to the pint. An hour's washing completes them.

The writer's preference is for the platinum toning bath, as this gives prints of a sepia to warm black color, the gold tending rather to purple. The strength of solutions and two-fold method of application will be found to give brilliant prints, rich in contrast. If the contrasts are too great, the solutions may be applied once instead of twice, or they may be used more dilute. The latter is better, as the double application helps to secure evenness of coating, and is well worth the extra trouble. If the solutions are diluted, the solution of salt, before adding to the arrowroot, and the solution of silver nitrate, should each be diluted to the same proportion.—P. Hodgson, in *Photography.*

Some Things You Should Not Do—and Why

The rule-of-thumb photographer often succeeds in producing excellent results. This is largely due to the fact that he usually combines a considerable amount of common sense with no small degree of manipulative skill. But there are a number of points which crop up in practical work in which common sense alone is not a sufficient guide, and when some theoretical knowledge will frequently prove to be of the greatest practical importance. It is proposed to set out a few of the many cases in which this holds good. Usually it will be noted that the dangers you are warned against are the result of secondary action, and can hardly be foretold unless the theory of the processes involved is understood.

You should not use very strong fixing solutions. It is generally recognized that solutions at very different temperatures are likely to strain the gelatin film, and set up frilling and blisters. Exactly the same effect may be obtained by using solutions of greatly varying densities. If it is ever necessary (it never should be) to use fixing, or any other bath, of very great strength, the negative or print should not be transferred straight from it into pure water, but should be placed first in a bath of normal strength, in order that the strain on the film from the change of density may be more gradual. It may be worth pointing out that it has been proved that a strength of fixing-bath of over 8 ounces of hypo to 20 ounces of water not only adds nothing to the speed of working, but even makes it slower, as the more dense fluid takes a longer time to penetrate the film.

You should not focus with a large stop, stop down, and expose without refocussing. Of course, this is often done, and with a few types of lenses it does not matter. But with most types the only way of obtaining really accurate focus is to use the same stop when examining the image as you intend to use for the exposure. If you use a small stop it will, of course, be difficult to trace any error on the negative, but it will be there. The stopping down of a lens is simply using only the center of it, and that portion often has an appreciably different focus from that of the whole lens.

You should not make up solutions containing potass. metabisulphite with very hot water. It is true that this assists very greatly in dissolving a somewhat stubborn chemical, but, at the same time, it decomposes it, making it less effective, if not actively harmful in the solution.

You should not keep or use sodium sulphide anywhere near stocks of plates or paper. It is not an uncommon procedure to sulphide-tone prints in the printing room, where paper may be stocked. If this is done, the fumes from the sulphide will penetrate the wrappings of any sensitive material in reach and cause endless trouble with spots and patches of fog. The results are much the same as when the materials are stale.

You should never lay out wet prints on any paper other than prepared blotting. This is sometimes done when a big batch overflows the usual drying space, and when damping down prints for wet mounting. It may be fatal to the permanence of your prints, most papers being bleached with chemicals which are not thoroughly washed out, the residues of which will have deadly effects on any print placed on it when wet.

You should never use a freshly-made solution until all the constituents have dissolved. I have often seen this done, especially with developers when the sulphite and carbonate refuse to dissolve. The idea seems to be that a little longer development will make up for the solution being "weaker." That, however, is only half the trouble. If some of the ingredients have dissolved and some have not, the proportions will be all wrong; you may get such rapid action as to produce chemical fog, or you may find the developer so restrained as to be useless. The varying results are too often put down as errors in exposure.

You should not think that the faster the water flows through a washer the faster are the plates being freed of hypo. As a matter of fact, a gentle stream is much more quick and effective in its results than is a miniature Niagara. Only a small part of the hypo you wish removed is on the surface of the negative, the greater part is deep down in the film itself. A quick flow of water will pass over the surface of the film, and hardly penetrate at all, while a slow stream will penetrate, soak up the hypo and carry it off.

You should not put a plate straight from the developer into the fixing-bath without an intermediate rinse in clear water. There may be no immediately observable bad effects, but negatives so treated are very liable to develop spots after a year or two, presumably because some chemical compound is formed which prevents perfect fixation or refuses to be washed out in the ordinary way. In addition, it is a practice which causes the fixing-bath to become thick, discolored and useless after the first day's work.

You should not allow spilt solutions to "dry up" on floor or bench. It is not only that they will rot the wood, but almost every solution used in photography will, if evaporated in this way, deposit tiny crystals of its solid contents; these crystals are remarkably light, and will soon be stirred up and float in the air of the dark-room until they find a convenient resting place, as often as not on a sensitive plate, with the result of mysterious spots. For the same reason never leave a spoilt print or negative saturated with solution to dry in the dark-room; either wash it free of chemicals or else put it outside at once.

Never forget that because a dish "looks" clean it is not necessarily chemically clean. Most solutions, hypo in particular, penetrate into the pores of their containers, even if of glazed porcelain or enamel. No amount of ordinary washing can remove them, and should any different solution be used in the dish, it is highly probable that it will be contaminated. One dish, one solution, is the only safe rule.

You should never forget that a photographic plate is sensitive to many influences besides that of light. Friction, electricity, heat and chemical fumes all have effects upon it. Therefore, it is unwise to handle it more than absolutely necessary, and there is no doubt that the best way to keep plates is in their original packings until the moment they are wanted in the slides.

You should never leave a color filter in strong light any longer than is necessary. Some are liable to fade, and you will find they have lost their virtues as color correctors and have an uncertain effect on exposure. Lenses also are best kept in the dark, with a cap at each end as protection from the air; if left about long in an impure atmosphere, even the best of lenses will become discolored, which, of course, slows their speed very much.

Never blame any maker's materials for not giving good results if you do not use the solutions recommended for them. It is true that some developers, for instance, are suitable for almost any plate, but you do find some makes of material which are greatly influenced by even small variations in the composition of solutions, and will only give their best effect when used with a specially compounded mixture. This is especially true of papers of the slow bromide and gaslight types, which may account in part for the poor results so often obtained on such paper. After all, it is only fair to the makers that you should follow their instructions.

Never forget that in making photographs you are simply utilizing natural laws. There is no possibility of them failing you; if you do not obtain the best results, either your material or your manipulation has been wrong, and there is not much faulty material about in these days, unless it has been badly kept since leaving the factory.—Arthur G. Willis, in *B. J.*

Stripping and Remounting Negatives and Cleaning Off Old Plates

By manipulating the light, cracked negatives can sometimes be printed without causing the crack to show in the print, but where the negative proper is intact it is often better to strip the coating from the glass and remount it on another plate. This can be safely done in the following manner:

1. First, fix and wash thoroughly an unexposed plate of the desired size. This provides a remount glass with a transparent coating to which the stripped negative will adhere.
2. Before stripping the negative from the old glass, toughen it by soaking in a weak solution of formaldehyde. Then rinse and dry.
3. Immerse in the following solution:

Water	16 oz.
Sodium fluoride	2 dr.
Sulphuric acid	2 dr.

This solution quickly loosens the emulsion from the glass support so that it can readily be stripped off by pulling gently inward from the edges and corner.

4. Soak the stripped negative for a few minutes in water to which have been added a few drops of ammonia to neutralize the acid.
5. Transfer the stripped negative to the remount glass already prepared, and set aside to dry.

The foregoing process is not difficult, and it is useful for other purposes than that of salvaging a negative of which the glass support has been cracked. It can be utilized effectively in commercial work in making combination negatives, and in many other instances where a substitution or replacement in some part of the negative is advisable.

The stripping bath alone may be used where it is desired to clean the emulsion off old glass negatives or special plates in order to use the glass for other purposes. The formula is an excellent one for this purpose as it does the work rapidly and leaves the glass entirely clean of the emulsion.

While the stripping bath need not be made up with great exactness where the purpose is merely to clean the emulsion off the glass, yet it should not be too strong, as this has a tendency to break up the emulsion, making the job somewhat messy.—*Portrait.*

Green Tones on Bromide Prints[1]

The best prints are those from a vigorous negative and they should be of full depth, as the process tends to reduce them. Glossy surface paper gives a greater depth of image than the matt papers.

The following stock solutions are required. All keep well except solution C which will only last a month or two.

A

Lead acetate cryst. . . .	10 dr.
Iron perchloride solution, 45 deg., Beaumé	190 mm.
Glacial acetic acid . . .	1 oz.
Water to make	10 oz.

B

Lead acetate cryst. . . .	1 oz.
Glacial acetic acid . . .	1 oz.
Water to make	10 oz.

C

Potassium ferricyanide . .	1 oz.
Water to make	10 oz.

---

[1] A paper read before the French Photographic Society by M. Moqueene.

D

Iron perchloride solution, 45 deg.	10 mm.
Glacial acetic acid	50 mm.
Water to make	10 oz.

In preparing A the lead acetate should be dissolved in about 5 ounces of water and the iron and acetic acid then added with constant stirring. Make up to the 10 ounces, and after standing for a day or two in a cool place filter to remove the lead chloride which has been deposited in crystals.

All prints should be thoroughly fixed, washed and dried before toning.

Green-blue Tones. Place print for two or three minutes in a bath containing 1 ounce of acetic acid in 8 ounces of water until it becomes limp, then place for six minutes in following bath, which will serve for about half a dozen quarter-plate prints in succession.

Solution A	½ oz.
Solution C	½ oz.
Water to make	5 oz.

This bath must be kept rocking, and in it the print will turn blue. It is then washed for fifteen minutes in clean water, then placed for two or three minutes in the acetic acid bath, again washed, once more treated with the acid and again well washed. It is then put through two baths of citric acid, containing 2½ grains of the acid to the ounce, and given a final wash for one hour. All this is necessary to remove the salts of lead and ferricyanide and to secure pure whites which will not afterward become yellow. The surface of the print should be wiped with clean cotton, and the use of very hard water should be avoided.

The well-washed print is now placed in a bath of potassium chromate (not bichromate) containing ¼ to ½ a grain to the ounce; this changes the tone to green-blue. The print is then washed, passed through the citric acid bath and again washed, these washings being very brief.

Bright Green Tones. The prints are treated exactly as before described, with the exception that the first toning bath is modified as follows:

Solution A	200 mm.
Solution B	50 mm.
Solution C	½ oz.
Water to make	5 oz.

By varying the proportions of A and B the color can be varied, the green becoming more yellow as more of B is used relatively to A. If, however, a yellow green is aimed at stronger prints are required in the first instance.

Pure Green Tone. Treat as before in the acetic acid bath and then put for a minute and a half into:

Solution B	¼ oz.
Solution C	¼ oz.
Water to make	5 oz.

Then transfer without washing to the toning bath used for blue-green tones and keep in for six minutes. Wash well, then immerse in solution B which gives a strong blue toning. Afterward continue as before, with the acetic and citric acid baths and washing, and the final treatment with chromate. The green tone thus obtained is the same in all parts of the print, shadows and high-lights and the precise color can be modified by varying the time in the first lead bath. If the print surface loses its brilliancy it can be glazed in the usual way, either by squeegeeing on glass or by the use of encaustic paste or some other lustre-giving preparation.

Color-sensitiveness of Different Silver Salts

EMULSIONS of the various salts examined were prepared by adding to a solution of 100 gms. gelatin in 500 c.c. water a solution of a slight excess of the corresponding salt in 200 c.c. water and 50 gm. silver nitrate in 300 c.c. water. The color sensitiveness was examined either directly with the aid of a spectroscope, or, where the sensitiveness was only slight, by the aid of a Chapman-Jones exposure scale, the color patches of which were examined spectroscopically. Silver chloride is sensitive to all parts of the spectrum and more sensitive to the less refrangible rays than silver bromide.—F. KROPF, in *Phot. Korr.*

Quality plus.

Add to the quality
of a good negative—
make the print on:

ARTURA

*The paper without a
disappointment.*

ARTURA
TRADE MARK

All Dealers'.

EASTMAN KODAK COMPANY
ROCHESTER, N. Y.

WILLIAM J. DORNAN, PRINTER, PHILA.

The detail of white draperies—of any highlight, in fact—is made up of lights and shadows.

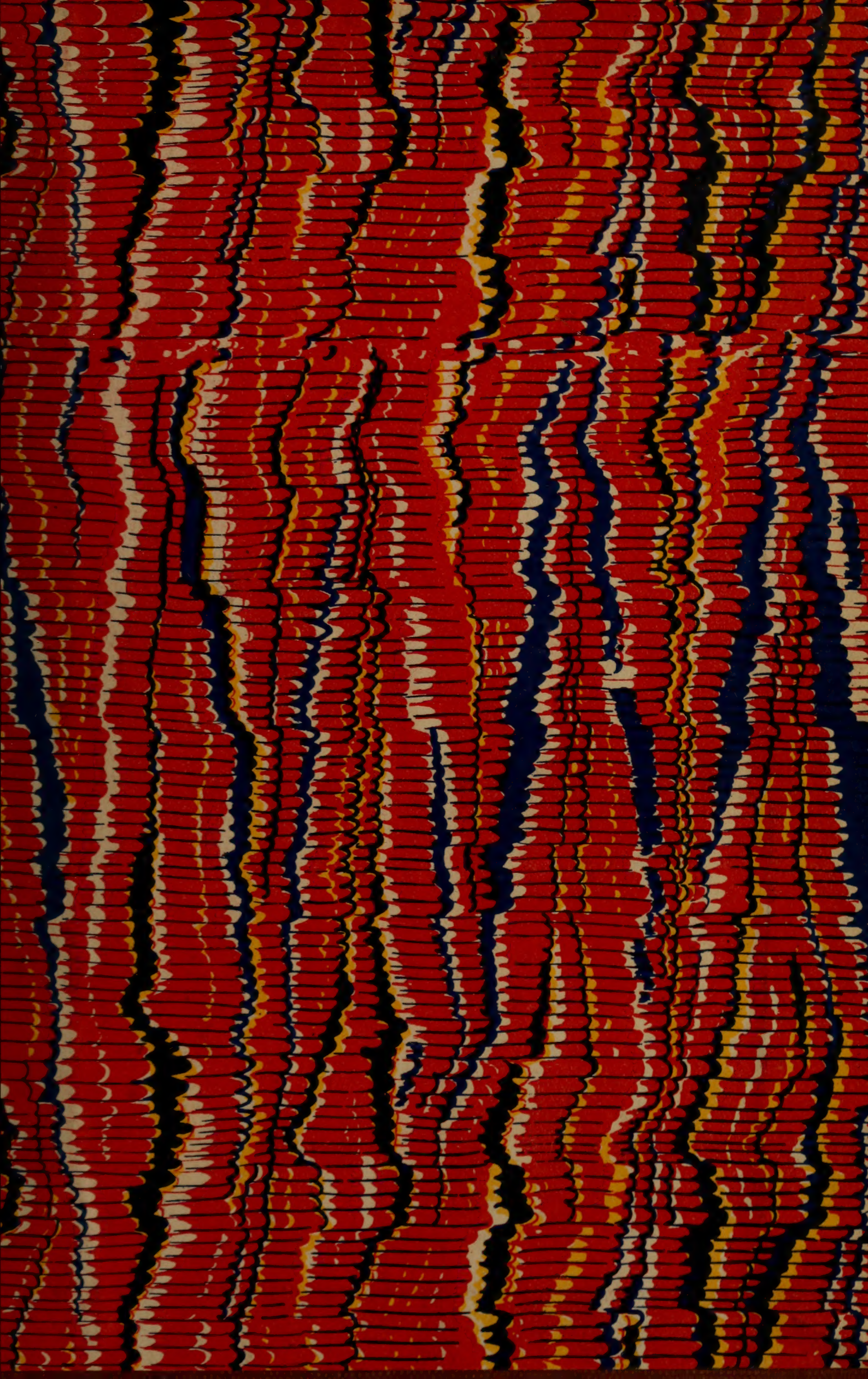
If halation from the lights destroys the shadows, the highlight detail and brilliancy is lost.

Preserve this quality—use:

Portrait Film

EASTMAN KODAK COMPANY
ROCHESTER, N. Y.

All Dealers'.



SMITHSONIAN INSTITUTION LIBRARIES
3 9088 01549 0964